



TOOELE ARMY DEPOT
Tooele, Utah

**Monitoring Well D-18
Completion Report
Phase II RFI Groundwater
Investigation**

Contract Number: GS-10F-0179J



**US Army Corps
of Engineers®**

Submitted to:
U.S. Army Corps of Engineers
Sacramento District

February 2006



Prepared by:
PARSONS and **KLEINFELDER**
Salt Lake City, Utah

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ABBREVIATIONS AND ACRONYMS

µg/L	micrograms per liter
API	American Petroleum Institute
ASTM	American Society for Testing Materials
bgs	below ground surface
btoc	below top of casing
CTC	carbon tetrachloride
DWR	Division of Water Rights
gpm	gallon per minute
IWL	Industrial Wastewater Lagoon
MCL	maximum contaminant limit
mg/L	milligram per liter
NAD	North American Datum
NEB	Northeastern Boundary Plume
NGVD	National Geodetic Vertical Datum
NTU	nephelometric turbidity unit
NPL	National Priorities List
PDB	passive diffusion bag
PID	photoionization detector
ppm	parts per million
PVC	polyvinyl chloride
RCRA	Resource Conservation and Recovery Act
RPD	relative percent difference
RFI	RCRA Facility Investigation
RL	reporting limit
STL	Severn Trent Laboratories
SWMU	Solid Waste Management Unit
TCE	trichloroethene
TEAD	Tooele Army Depot
UAC	Utah Administrative Code
UDEQ	Utah Department of Environmental Quality
UID	Utah Industrial Depot
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USCS	Unified Soil Classification System
VOA	volatile organic analysis
VOC	volatile organic compound
WW	water well

1. INTRODUCTION

This report contains detailed information regarding the drilling, construction, development, and sampling of groundwater monitoring well D-18, located northeast of the Tooele Army Depot, Utah (TEAD). This report was prepared for the US Army Corps of Engineers (USACE), Sacramento District, under Contract GS-10F-0179J, on behalf of TEAD by Kleinfelder, Inc., (Kleinfelder) and Parsons in Salt Lake City, Utah.

TEAD is an active military facility located approximately 35 miles southwest of Salt Lake City, Utah (Figure 1.1) and it has been in operation since 1942. TEAD has been a primary storage, maintenance, and disposal facility for conventional munitions since its inception. Due to impacts to groundwater quality resulting from this activity, TEAD was added to the National Priorities List (NPL) under the federal Superfund program in October 1990.

1.1 BACKGROUND INFORMATION

Historical wastewater discharged to the unlined Industrial Wastewater Lagoon (IWL) at TEAD resulted in a large impacted groundwater plume beneath the eastern portion of the Depot. A large number of monitoring wells, piezometers, extraction wells, and injection wells have defined a trichloroethene (TCE) plume along downgradient, northern, and western extremes of the Depot. This occurrence of impacted groundwater was designated the Main Plume.

In 1986, TCE was detected in an off-site production well located north of the Industrial Area, approximately 5,000 feet (ft) northeast of the IWL. In 1994, well C-10 was installed at the northeastern boundary of the Depot. TCE was detected at a concentration of approximately 240 micrograms per liter ($\mu\text{g/L}$) in groundwater sampled from well C-10, located directly across the road from the impacted off-site production well (Kleinfelder, 1998).

Additional groundwater investigations were conducted to further assess the nature and extent of groundwater contamination at the northeastern boundary of TEAD. These additional investigations indicated that the contamination in well C-10 and the adjacent off-site production well had likely originated from a source different from that attributed to the Main TCE plume. Thus, two plumes of groundwater contamination were indicated. This second, more easterly plume, was designated the Northeastern Boundary (NEB) Plume. The oil-water separator at Building 679 in the former industrial area (now the privately owned Utah Industrial Depot [UID]) was identified as a major source of this plume (Kleinfelder, 2002).

A subsequent investigation was designed to define the approximate off-site extent of the NEB Plume. The plume, which is relatively narrow beneath the former industrial area, extends

approximately 16,000 ft downgradient (to the north) from the identified source at Building 679 (Parsons, 2003a). The installation of groundwater monitoring well D-18 was conducted in accordance with the Phase II Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Solid Waste Management Unit (SWMU) 58 Work Plan (Parsons, 2003b) and Work Plan Sampling and Analysis Plan Addendum 1 (Parsons, 2004) that were approved by the USACE and the State of Utah Department of Environmental Quality (UDEQ) prior to initiating fieldwork.

1.2 PROJECT PURPOSE AND SCOPE

Monitoring well D-18 is one of fifteen groundwater monitoring wells installed between September 2004 and September 2005 during the Phase II RFI at SWMU 58. SWMU 58 encompasses the source areas and the areas impacted by the Main and NEB TCE Plume. Objectives of the groundwater investigative component of the Phase II RFI are to:

- Refine the vertical limits and lateral extent of the Main and NEB chlorinated solvent plumes;
- Further characterize the distribution of contaminants within the plumes;
- Ascertain whether there are additional contaminant sources to the NEB Plume and assess their impacts to groundwater;
- Assess the risks to human health associated with the unmanaged (off-site) portion of the NEB Plume; and
- Refine the existing numerical groundwater flow and solute transport models with respect to fate and transport, in order to better predict the potential extent (stability) of the plume in the future.

Investigative efforts described in this completion report were supervised by a State of Utah-registered Kleinfelder geologist who was present for critical on-site activities. Before drilling began, a land lease (access and well easement agreement) was negotiated with the property owner, Perry/Tooele Associates, LLC, and a permit for well installation was obtained from the State of Utah Division of Water Rights (DWR). Copies of the lease agreement, the Parsons “request for authorization to drill” and DWR “authorization” letters, Applicant Start Card, and Driller (Start) Card are included in Appendix A. Underground utility clearance was obtained through the Blue Stakes Location Center.

To minimize the danger of wildfire due to drilling activities, Parsons personnel cut the cheat grass within a 75 foot radius around the well site, and also along the access routes to the proposed well. During drilling, a 750-gallon capacity water buffalo was stationed adjacent to the drill rig in the event that a fire did accidentally start.

Monitoring well D-18 was drilled, constructed, developed, and sampled between July 1 and July 19, 2005. Drilling and construction activities were conducted by Layne Geoconstruction (Layne) of Salt Lake City, Utah. Following completion of the well, Layne issued a Well Driller's Report, which is also included in Appendix A. Well development and groundwater sampling were completed by Veolia Water North American Operating Services, LLC, which operates the groundwater treatment plant at TEAD. Laboratory analyses were provided by Severn Trent Laboratories (STL) of West Sacramento, California, a State of Utah, and a USACE-certified analytical laboratory. Down-hole geophysical logging was performed by RAS, Inc. of Golden, Colorado. Transport of suspect hazardous drill cuttings and potentially impacted groundwater generated during drilling and well development to the UID 90-day yard was provided by MP Environmental of Grantsville, Utah.

Monitoring well D-18 is located in the NW ¼ of Section 7, T3S, R4W, Salt Lake Base and Meridian. Primary access is from Sheep Lane, then southeast along the abandoned railroad grade, for about 1.25 miles to a well easement along the west boundary of State of Utah parcel 2-138-4, then north about 800 ft along that easement to the intersection of the northeast-trending well easement between monitoring wells D-3 and D-5, then northeast along that easement for about 2,700 ft to monitoring well D-7, and then northwest some 3,700 ft along the D-18 well access easement to that well. The well can also be accessed from 1200 West, by following the access route that leads to well D-17, and then continuing south about 2,000 ft along an access easement to well D-19, then continuing southwest along an existing easement for about 500 ft until a T-intersection is reached, and then going right (northwest) along an existing dirt road for about 1,800 ft.

The primary purpose of monitoring well D-18 was to define the approximate margin of the NEB Plume as defined by the 5 µg/L TCE isoconcentration contour. A secondary objective was to assist, in conjunction with other proximal wells, in defining the hydraulic gradient and groundwater flow direction in this portion of the plume (Parsons, 2003b).

2. DRILLING, SEDIMENT SAMPLING, AND LOGGING METHODS

2.1 DRILLING

Groundwater monitoring well D-18 was drilled by Layne Geoconstruction of Salt Lake City, Utah, between July 1 and July 6, 2005 using a Becker AP-1000 percussion hammer drilling rig manufactured by Drill Systems. The AP-1000 advances a dual-walled 10-inch diameter drill pipe into the subsurface by means of a diesel-powered pile hammer. Circulating air is pumped down the space between the inner and outer walls of the drill rod to the drill bit, where formation cuttings are picked up and carried back through the center of the drill rod and out of the borehole as the air returns to the ground surface. Cuttings are separated from the discharging air by a cyclone. Dry cuttings were collected and spread on the ground around the well site, whereas saturated cuttings were contained in 55-gallon drums pending analytical results.

2.2 SAMPLING OF DRILL CUTTINGS

Cuttings were observed continuously as they discharged from the cyclone and were collected in 1-quart bags and chip trays. The cuttings were logged at 5-foot intervals or when significant changes in lithology occurred. Drive sampling, used in previous boreholes drilled as part of this program, was rarely successful due to refusal in coarse sediments and inability to anticipate encountering thin, fine-grained layers. Thus, a more accurate and complete borehole log resulted from continuous observation of cuttings from the cyclone.

Drill cuttings were logged using the American Society for Testing Materials (ASTM) Method D2488-00. The Unified Soil Classification System (USCS) was used for designating the various types of unconsolidated material encountered. Where a conflict between the two methods was identified, the ASTM convention took precedence. Color of the drill cuttings (when wetted) was noted by referencing the Munsell color chart system. Estimated percentages of gravel, sands, and fines; degree of roundness and lithology/mineralogy of any gravel clasts; moisture content; degree of cementation; and any other notable attributes were routinely recorded in the sample description. The Becker Hammer Drilling method allows for a maximum clast size of about 6 inches to pass through the drill pipe to the surface, so while boulders and cobbles exceeding this dimension may exist, their percentages cannot be estimated.

Grab samples of drill cuttings from below the saturated zone were logged and screened for volatile organic compounds (VOCs) using a photoionization detector (PID). PID readings were also included on the boring log. PID readings from the grab samples from this boring ranged from 0.0 to 0.7 parts per million (ppm). A composite of these samples was submitted for VOC analysis, which was used to determine the proper means of disposal for all saturated cuttings

from this borehole. Saturated drill cuttings were containerized in 55-gallon drums and transported to the UID 90-day yard to await analysis.

2.3 RECORD KEEPING

While on site, Kleinfelder's geologist maintained records of all activities in a bound field log book, on Daily Field Report forms, Drill Rig Inspection forms, Safety Meeting Forms, and Equipment Calibration Logs. Copies of these records are presented in Appendix B.

3. SUMMARY OF SUBSURFACE CONDITIONS

3.1 GEOLOGIC LOG

A Kleinfelder geologist was on-site during drilling to collect samples of drill cuttings in order to maintain a continuous geologic log of the subsurface conditions that were encountered. Lithologic descriptions and the geologist's observations were entered onto the geologic log. The geologic log of the cuttings that were sampled during drilling of the monitoring well D-18 borehole is included in Appendix C.

The unconsolidated sediments intersected in this borehole can be divided into three major sequences based on the depositional environment. The uppermost assemblage is represented by approximately 42 ft of fine-grained clay, silt, silty sand, and silty sand with gravel of probable lacustrine origin. The underlying sequence (~42-54 ft) of dominantly coarse-grained sediments may represent a transitional zone between the overlying lacustrine deposits and the underlying predominantly coarse sediments of alluvial fan origin that comprise the sediments intersected by this borehole. These three units are described in greater detail below.

The uppermost sequence is a distinctive series of three fine-grained units: a lean clay (CL) to 18 ft, a silt (ML) to 24 ft, a silty sand (SM) to 28 ft, and a silty sand with gravel (SM) to 42 ft that on the basis of sediment type and elevation is considered to have been deposited in Lake Bonneville during the Late Pleistocene. Contacts between the units are somewhat gradational, as might be expected. The sequence appears correlative with a lacustrine silt unit of similar thickness encountered at the top of monitoring wells D-9, D-8, D-10, and D-17. The fining upward of this sequence is posited to reflect transgression of the lake to the southeast. Thus, the silty sand with gravel unit (28-42 ft) was probably deposited in a beach or near shore environment but with the possible addition of minor alluvial fan gravel. In contrast, the lean clay interval (0-18 ft) is interpreted to represent a deeper water lacustrine facies.

A diverse sediment sequence consisting of silty clay with gravel (CL), well graded gravel with sand (GW), and a cobble-boulder unit within a clay matrix between 42 and 54 ft below ground surface (bgs) may represent a transitional zone between lacustrine and alluvial fan depositional environments.

A sharp contact separates the transitional assemblage from the underlying thick sequence consisting largely of well-graded gravels containing variable amounts of sand and silt. Cobbles and/or boulders are present locally. This sequence extends at least to the bottom of the well at 220 bgs. The gravels and coarser-grained sediments are interpreted to represent alluvial fan deposits that formed in a dynamic high-energy depositional environment of coalescing alluvial fans. The majority of the coarse-grained sediments consist of sub-rounded to sub-angular clasts

of quartzite and limestone that appear water-worn. While some angular clasts are observed, these are likely products of the mechanical breaking caused by the drilling method.

Intervals of less permeable fine-grained and/or clay-rich sediments within the alluvial fan gravels were logged from 149-154, 168-182, 213-214, and 216-220 ft bgs. Most of these intervals contain a significant gravel component. Differences in the relative percentages and types of fine- and coarse-grained materials reflect specific types of alluvial fan deposits, including debris flow, stream channel, sheetflood, and sieve that have been defined (Collinson, 1978). The geologic log also indicates caliche-cemented zones were encountered at depths of 195-198 and 214-216. No bedrock was encountered during drilling of monitoring well D-18.

Saturated cuttings were first observed at 185 ft bgs, and free water from the cyclone was initially encountered at approximately 194 ft bgs. However, following completion of the borehole, the water level rose significantly once the casing was pulled back from 220 to 190 ft. Three observations collectively indicate that the clayey gravel is acting as a semi-confining unit at this location: 1) the rise in the water level; 2) the depth at which saturated cuttings were first observed; and 3) the presence of a low permeability interval (clayey gravel with sand) from 168 to 183 ft bgs. This unit may be correlative with the semi-confining clayey gravel interval of similar thickness that was encountered in monitoring well D-17. Matt Ivers, the on-site geologist, noted that although saturated cuttings were encountered at about 184 ft bgs, the greatest water production occurred between about 202 and 205 ft bgs, after the outer casing was retracted above this interval to a depth of about 190 ft. Two aspects of the hydrogeology, as documented on the geologic boring log, may help explain why the highest flow appears to be confined to that limited or approximate interval. First, the strongly cemented caliche zone present from about 194 to 198 ft bgs may be acting as another aquitard. Second, a well-graded gravel with sand (GW) interval (198-204 ft bgs) appears to roughly coincide with the highest producing zone. Moreover, underlying this gravel is a well-graded gravel with clay (GW) zone (204-210 ft bgs) that is surmised to have a somewhat lower permeability relative to the overlying gravel at 198-204 ft owing to the greater clay content. Thus, the high flow within the GW unit at 198-204 ft is at least partially explained by the estimated relative permeabilities of the three units described herein.

After well construction and development the potentiometric surface was measured at 141.66 ft below top of casing (btoc) (138.8 ft bgs) by Veolia Water. The potentiometric surface elevation for D-18 based on that depth to water measurement agrees well with the interpolated value approximated by plotting the water table elevations for nearby wells D-8 (now abandoned) and D-9. The agreement is strong evidence in support of the supposition that the semi-confined water-bearing zone at D-18 does in fact represent the regional valley fill aquifer.

3.2 GEOPHYSICAL LOGS

As a secondary interpretive tool, down-hole geophysical logging of monitoring well D-18 was completed within the polyvinyl chloride (PVC) cased well following construction. Natural gamma ray (gamma) and induction electric (induction) logs were run simultaneously by RAS on September 10, 2005 using a combination gamma ray-induction tool manufactured by Century Geophysical Corporation of Tulsa, Oklahoma. The gamma and induction logs for this well are contained in Appendix C. Data validation was attained via a repeat logging run of a selected stratigraphic interval within the well.

The former logging technique measures the natural gamma emissions emanating from the formation surrounding the borehole. This radiation is released from nuclei of an unstable element decaying to a more stable element. Potassium 40 is the element responsible for most of the gamma radiation detected by the gamma ray probe. This element is very abundant in a number of rock-forming minerals, such as potassium feldspar, that weather to clays. Thorium- and uranium-bearing minerals also produce a gamma ray response, but in most geologic environments, including the unconsolidated valley fill deposits at the project site, the potassium-40 isotope is most abundant. Hence, as the clay content of the sediment increases, the gamma ray response also increases. Conversely, the gamma response becomes progressively weaker as the quartz content of the sediment increases. A comparison of this and other monitor well boring logs with their respective gamma ray logs shows a very strong correlation between finer-grained, clay-rich units and gamma ray peaks. Slight offsets between a gamma peak and the location of the fine-grained interval are attributed to an inability to define the exact depths of unit contacts owing to the time required for the cuttings to travel up the borehole and reach the surface. The measurement scale of the gamma-ray log is in American Petroleum Institute (API) units, accepted as the international reference standard that allows consistent comparisons to be made between a wide variety of gamma-ray counting devices.

Over the upper portion of this boring, and particularly within the intervals marked by gravel with variable amounts of sand and silt, the average (background) response is between 120 and 155 API units. Below about 120 ft, the background response gradually declines to between 90-100 API units at the bottom of the well. A few pronounced peaks and one broad high punctuate the otherwise relatively uniform response for this boring.

The broad high occurs between about 5 and 23 ft, and corresponds partially to the lean clay interval at the top of the boring, as well as the underlying "silt (ML)" interval. Below that depth the response drops off due to an increase in sand and silt content. A weak gamma peak marks a zone of slight clay enrichment at about 105 ft. Pronounced gamma peaks correlate with the silty clay with gravel (CL) interval at 149-153 ft, and a narrow clayey gravel zone at about 180-182 ft that is marked by a significant increase in clay content. Minor fluctuations in the gamma curve

within the background zones are interpreted to represent subtle changes in mineralogy and clay content.

A few minor peaks of ~150-180 API units do not correlate with any fine-grained units identified in the geologic boring log. These peaks may be caused by minor clay enrichment or subtle changes in mineralogy. Alternatively, one or more very narrow clay-rich zones may have been missed during the collection and logging of the drill cuttings.

The induction log measures the conductivity from high frequency alternating currents that are induced into the geologic formation, and is best suited where the formation is characterized by low to medium (less than 50 ohm-meters) resistivity values, the geologic medium exhibits medium to high porosity, and the open borehole was advanced using mud or air as the drilling fluid. Induction logging can be performed in boreholes cased with PVC, but not with steel pipe. Although the induction device measures conductivity, by convention, the conductivity readings are converted to a resistivity curve when plotted on a down-hole log via a simple inverse relationship.

Three curves are shown on the induction logs that were run by RAS. They represent the direct conductivity (millimhos/meter) readings as designated by a dashed (“cond”) curve on the plot, a conductivity (“ap-cond”) curve designated by a dotted line that has been corrected for the temperature of the induction probe, and resistivity (ohm-meters) measurements derived from a conversion of the temperature-corrected conductivity readings that are depicted as a solid (“res”) line on the induction log plot. Note that although the conductivity and resistivity curves appear to mimic one another, the scales for the two properties are reversed since their relationship is an inverse one.

The induction electric logs exhibit a fairly constant response over much of this boring. Background resistivity values range between about 9 and 12 ohm-meters, while the background temperature-corrected conductivity response fall between 75 to 100 millimhos/meter. The most pronounced induction response is the conductivity high and attendant resistivity low associated with the lean clay and underlying “silt” (probably a silty clay) between 5 and about 23 ft bgs. Several other conductivity highs/resistivity lows were recorded above 45 ft bgs, in response to a number of clay-enriched zones. In general, only a few isolated and weak perturbations below that depth were recorded in the induction electric logs. Few of these anomalies below 45 ft can be attributed to distinct geologic units or features. One exception is the weak resistivity high at 195 ft bgs, which reflects a strongly (?) caliche-cemented zone in gravels.

Several of clay-rich units identified on the geologic log are marked by resistivity lows and conductivity highs as might be expected, though the only dramatic response from the clay and silt units is near the surface (6-23 ft). These lows, however, fall within the background interval, and thus by themselves are not diagnostic of fine-grained clay-rich sediments.

In summary, the induction electric and gamma logs appear consistent with the subsurface conditions as interpreted from the drilling response and geologic logging of the drill cuttings. The fine-grained lacustrine sediments exhibit the most pronounced gamma and induction electric responses due to the high clay content. The zone transitional between a lacustrine and alluvial fan depositional environment is also characterized by significant variation in the gamma and induction electric curves. Within the relatively monotonous alluvial fan gravels, both the gamma and induction electric responses are much more consistent, although clay-rich zones are generally identified by significant gamma peaks.

3.3 HYDROSTRATIGRAPHIC SECTION

To aid in understanding the subsurface geology and water table configuration in the vicinity of this monitoring well boring, the geologic log for well D-18 was plotted on a straight line cross section (D – D') trending southwest-northeast over a distance of approximately 8,000 ft that is also defined by monitoring wells D-08, D-10, D-17, and D-19 (Plate C-4). D-10 is the only well not projected onto the section; the projection distances for the other wells are provided on the cross section. The cross section location is illustrated on Plate C-3.

As discussed in Section 3.1, the upper 42 ft of this borehole encountered a distinctive sequence of fine-grained dominantly clay- and silt-rich sediments of probable lacustrine origin that is correlative with similar sediments in most of the other proximal wells. This sequence includes virtually all of the fine-grained sediments shown on cross section D – D' (Plate C-4) (depicted by the yellow shading) that lie above an elevation of approximately 4425 ft.

Below the 4425 ft elevation datum, the sediments encountered in each of the wells are dominantly or entirely of alluvial fan origin. Solid yellow intervals lower in the stratigraphic section that exhibit a significant thickness contain a significant gravel component, but also are characterized by a measurable clay and/or silt fraction. However, they do not contain, nor are they spatially associated with nearly homogeneous thick (>10 ft) clay or silt deposits similar to those observed within the lacustrine sequence at the top of these wells. Study of this cross section suggests that the predominantly fine-grained or clay-rich units within the alluvial fan valley fill sediments have limited lateral continuity (i.e., possibly extending between one or more adjacent wells). Overall, correlation of these units from well to well is considered poor or inconclusive.

The difficulty in correlating distinct fine-grained units within the dominantly alluvial fan gravels is not surprising, in view of the dynamics of this high-energy depositional environment. In general, fine-grained units deposited under such conditions are characterized by limited thickness and areal extent, and this also appears to hold true for the project area. The majority of

fine-grained silt- and/or clay-rich intervals are only a few feet thick and pinch out over a few hundred feet due to a change in the depositional environment.

Another plausible explanation for limited areal extent is post-depositional erosion and sediment reworking. Channel erosion is strongly suspected of causing the substantial difference in the thickness of a clay-rich lacustrine or floodplain deposit encountered in two closely spaced borings at Building 600 in UID. It almost certainly has been operative elsewhere.

There is another factor that may frustrate correlation of fine-grained units in this and other Phase II RFI groundwater monitoring wells. Most of these fine-grained units, even if they exhibit some lateral extent, were generally deposited on alluvial fan surfaces that are inclined several degrees or more. Over a distance of just a few hundred feet, a dip of even a few degrees translates into a change in elevation of up to 10 ft or more. Moreover, for monitoring wells spaced a thousand feet or greater, which is not atypical for the groundwater monitoring array at TEAD, differences in the elevation of a laterally continuous unit could be on the order of several tens of feet.

As per the fine-grained units, little success has been achieved attempting to correlate caliche-cemented zones that occur primarily in the gravels. The same general comments presented above for fine-grained sediment deposits also apply to correlation of cemented zones. The ability to correlate both fine-grained sediment units and cemented zones between monitoring wells in the project area may be contingent upon distinct downhole gamma and induction electric log signatures.

4. WELL CONSTRUCTION SUMMARY

4.1 CONSTRUCTION TECHNIQUES AND MATERIALS

This initial section summarizes the observations made and measures taken in the attempt to identify the water-bearing zone(s) during the advancement of D-18. During drilling of monitoring well D-18, the 10-inch Becker Hammer drive casing was advanced to a depth of approximately 185 ft bgs, at which point the cuttings became wet, but no free water was produced. At 194 ft bgs, free water was produced. At 210 ft, an attempt to measure the water in the well after pulling back about 4 ft of rod was not successful. The hole was then advanced to 220 ft bgs. At that depth it was assumed that the borehole had already been advanced past the significant shallow water bearing zone(s), and that the drive casing had effectively sealed them off. No attempt was made to obtain a water level measurement at that point because any reading would have been considered suspect. To obtain a credible reading the casing was then pulled up 30 ft to 190 ft bgs, allowing ingress of water. Allowing time for stabilization, the water level was then measured at 139 ft. The borehole bottom was sounded at 212 ft bgs, indicating some cave-in. Following discussions with USACE and UDEQ representatives, it was decided the borehole would be backfilled to 206 ft bgs with sand pack material, as the interval from 206 to 212 ft was a lower permeability well graded gravel with clay.

Because it was anticipated that the regional water table would be encountered at around 140 ft bgs in D-18, there was some concern when continued drilling in permeable gravels (i.e., well graded gravel with sand [GW]) failed to encounter any evidence of groundwater. Thus, despite having finally intersected a water-bearing zone at about 185 ft, and further confirmed its existence lower in the borehole, project personnel thought that another water-bearing zone within the regional valley fill aquifer might exist higher in the boring. Failure to identify such a zone during drilling was enigmatic but attributed to effective sealing by the drive casing. Moreover, a review of the geologic log submitted by the field geologist at the site shortly after termination of drilling did not identify any potential semi-confining units.

To ensure that any upper water-bearing zone was screened for groundwater sampling and possible evaluation of groundwater flow, a work plan variance addressing the installation of the well screen was developed and agreed to verbally during a conference call between Parsons, USACE, and UDEQ project personnel on July 7, 2005. A copy of the written variance, prepared for the record following that conference call, is presented in Appendix D. The variance specified the installation of two separate screens: a lower screen of 25 ft at 180-205 ft bgs, and an upper screen of 20 ft at 155-175 ft bgs, with a 5-foot blank and coincident bentonite seal between the two intervals.

Justification for the installation of two well screens is summarized here, but presented in greater detail within the work plan variance. Essentially the rationale for dual screens can be reduced to two issues relating to a lack of understanding regarding the dynamics of groundwater flow and the location of the water-bearing zone(s) at this wellsite. These concerns are predicated on the constraints that a 20-foot long well screen might impose on the understanding of: 1) any vertical stratification or concentration gradients exhibited by dissolved VOCs in groundwater, particularly if there is a measurable distance between the potentiometric surface and any confirmed or suspected water-bearing zone(s); and 2) groundwater flow using the colloidal borescope technology. Since D-18 represents a quasi-sentinel well in that sense that it is located along the approximate leading edge of the NEB Plume, it was critical that the well be designed to ensure that the contamination be adequately monitored as function of depth. Thus, the greater screen length installed in this well should facilitate the identification of any water-bearing intervals that were missed during drilling, and hopefully aid in a better understanding of flow regime at this location.

Construction of D-18 was initiated on July 7, 2005 immediately following agreement regarding a revised well design, and continued through July 11, 2005. After backfilling the boring to a depth of 205 ft bgs with 16-40 silica sand, the 10-inch drive casing was lowered to 205 ft bgs, and the well constructed entirely within it.

Two 10-foot sections and one 5-foot section of threaded, 4-inch diameter Schedule 40 PVC well screen with 0.010-inch wide slots were used for the lower screened interval. The intervening blank consisted of one 5-foot section of 4-inch diameter Schedule 40 PVC blank casing. The upper well screen consisted of two additional 10-foot sections of 0.010-inch slotted PVC screen. Eighteen 10-foot sections of blank PVC casing were used to complete the well string. The well riser consists of 2.87 ft of aboveground blank well casing.

Silica sand (16-40) was added to the annulus between the PVC and the borehole in the intervals adjacent to the well screens. To help minimize the risk of bridging, and to confirm that the correct volume of sand was added, the sand was poured slowly into the annulus from the surface and continuously monitored. The top of the sand interval for lower screen is coincident with the top of that screen. Coated bentonite clay pellets were added to the annular space adjacent to the 5-foot long blank casing by slow freefall from the top of the well. As per the lower well screen, silica sand (16-40) was added to the annulus between the PVC and the borehole for the upper well screen and brought to a level approximately 3 ft above the top of the upper screen. The upper sand-pack interval was isolated from the upper slurry-backfilled portion of the well annulus by a 4-foot thick seal of bentonite clay pellets. The remaining annulus above the bentonite clay pellets was grouted to approximately 30 inches bgs with 30 percent solids bentonite slurry in accordance with Utah Administrative Code (UAC) R655-4-9.4.2.

Following construction, the bottom of the well was tagged at a depth of 205.60 ft bgs. A well construction diagram is provided in Appendix D.

4.2 SURFACE COMPLETION AND SURVEY COORDINATES

A locking, 6-foot long, 10-inch diameter protective casing was placed around the uppermost part of the monitoring well casing, with approximately 3 ft above and 3 ft below ground. Concrete was used to partially fill and anchor the protective casing, fill the upper 5 ft of the borehole annulus, and build a 3-foot square by 1-foot thick pad (6 inches above ground surface) around the finished well. The concrete pad was finished to slope away from the protective casing and was embedded with a brass survey monument.

Four 4-inch diameter steel bollards were positioned around the pad to protect it from vehicular traffic. The bollards stand approximately 4 ft above the ground surface and extend about 2 ft bgs into concrete-filled post holes.

Ward Engineering Group of Salt Lake City, Utah, surveyed the well on July 29, 2005. Coordinates for the well locations are referenced to the North American Datum (NAD) 1983 Utah State Plane Central Zone and the elevation to the National Geodetic Vertical Datum (NGVD) 1929. Survey data are included in Appendix D.

5. WELL DEVELOPMENT

Groundwater monitoring well D-18 was developed using swabbing, bailing, and pumping methods on July 18 and 19, 2005. Development continued for approximately 6 hours and 46 minutes until the turbidity of the water produced was less than five nephelometric turbidity units (NTUs). All development water was collected and contained for later disposal pending analytical results (see Section 7.3). Well development records are included in Appendix E.

5.1 SWABBING AND BAILING

Swabbing and bailing took place for 2 hours and 45 minutes. Swabbing was done with a loose fitting surge block with an oversized rubber disk, slightly smaller than the inner diameter of the screen. Periodic measurements of pH, temperature, electrical conductivity, turbidity, and comments regarding the appearance of discharge water were recorded on well development records (Appendix E). About 120 gallons of water were removed from well D-18 by bailing during development.

5.2 PUMPING

After swabbing and bailing the well, development was completed using an electric submersible pump. The upper screen was pumped first on July 18, 2005. The pump intake was set with the pump intake at about the mid-point of the screen. It was then operated intermittently at rates ranging from 10 to 10.18 gallons per minute (gpm) for 2 hours and 50 minutes.

The lower screen was developed the following day, July 19, 2005. The pump intake was set about 1.5 ft off of bottom. Pumping occurred at a rate of approximately 10.05-10.18 gpm over an aggregate time of 2 hours and 13 minutes.

During development pumping of both screens, the pump was shut off a few times, and the water in the discharge piping allowed to back-flush (surge) into the well. Pumping and occasional back-flush surging was continued until there was no noticeable increase in the discharge water turbidity. Periodic measurements of pH, temperature, electrical conductivity, turbidity, and comments regarding the appearance of discharge water were recorded on well development records. The final turbidity at the bottom of the lower screen was measured at 0.97 NTU. An estimated 1,820 gallons of groundwater were removed by development pumping.

A drawdown-recovery test on D-18 was also performed during the pumping development of the lower screened interval (Appendix E). Drawdown data were recorded during the first pumping period (43 minutes) of that screened interval. The drawdown was recorded to be 2.80 ft after 43 minutes of pumping, but from the data it appears that a steady state condition was attained after about 2 minutes. The recovery measurements showed a return to pre-pumping water level in within 3 minutes.

The drawdown attained in this well was somewhat greater than the ≤ 0.50 ft typically observed in many of the Phase I and II RFI monitoring wells that are screened in well-graded gravel with sand and/or silt (GW). Nevertheless, the rapid attainment of a pumping equilibrium condition indicates a relatively elevated hydraulic conductivity. As mentioned above, the pump intake was placed about 1.5 ft above the bottom of the well (i.e., at about 204 ft bgs), at approximately the same depth as the contact between an overlying well graded gravel with clay (GW) and a well graded gravel with sand (GW). It is conjectured that partial pumping from the less permeable gravel with clay unit resulted in larger drawdown than would have otherwise been attained if the well were screened only over the well-graded gravel with sand.

6. GROUNDWATER SAMPLING

6.1 SAMPLING METHODOLOGY

Passive diffusion bag (PDB) samplers were deployed in well D-18 as per the Work Plan (Parsons, 2003) in order to characterize the vertical distribution of VOCs over the screened intervals. Following the removal and sampling of the PDBs, a series of KABIS[®] Samplers were lowered to varying well levels and depth-specific grab samples were taken for water quality analysis in order to evaluate the distribution of major ions as a function of depth. Technologies such as PDB and KABIS[®] Samplers that allow for multi-level sampling of groundwater are routinely utilized to determine if a detectable stratification of water chemistry exists over the screened interval(s) sampled. The presence of such stratification implies an absence of vertical mixing and of vertical hydraulic gradients. The two sampling methodologies are described in greater detail below.

PDB sampling is performed without purging and involves lowering a polypropylene bag filled with distilled water to a predetermined depth. Once in place, the water within the PDB sampler is allowed to equilibrate with the surrounding groundwater for 2 weeks. During this time, VOCs diffuse into the distilled water. The PDB sampler is then removed from the well and water is transferred into three pre-preserved 40 mL volatile organic analysis (VOA) vials.

Because of the two screened intervals, a total of six PDB samplers were placed in monitoring well D-18 on September 15, 2005 at depths of 155, 165, 175, 180, 192, and 205 ft bgs. They correspond to the top, middle, and bottom of both the upper and lower screened intervals. This distribution of PDB samplers was designed to provide adequate coverage so as to identify any concentration gradients with increasing depth that may exist, or any stratification of VOCs within the shallow aquifer. The PDB samplers were retrieved from well D-18 and sampled on October 4, 2005. The six groundwater samples were assigned sample identifiers D-18GW007 through D-18GW0012. The samples were submitted for analysis of VOCs using US Environmental Protection Agency (USEPA) Method 8260B.

The rationale for employing the KABIS[®] sampling technology was to determine, if possible, on the basis of the water quality analyses, whether two distinct water-bearing zones had been intersected in D-18. It was speculated that the groundwater encountered at about 185 ft bgs and below might be of considerably poorer quality (possibly Class 3 or 4 as defined by TDS content (UDEQ, 1998). Nonetheless, it is acknowledged that mixing within D-18 of groundwater from two distinct water-bearing zones might make it impossible to conclude with any degree of certainty if two zones existed, let alone whether the two zones were geochemically distinct.

The KABIS[®] Sampler is a passive interval-discrete-type sampler without any electrical or mechanical opening devices. It consists of a bullet-shaped stainless steel container. The inside lid of the container is equipped to attach up to three standard 40 ml VOC sampling vials (Model-II sampler) or a single 0.25, 0.5 or 1-liter polyethylene bottle (Model-III sampler). Two thin tubes extend upward from the lid to different heights, or in the instance of the Model-II KABIS[®] Sampler, three 40 milliliter VOA vials. The difference in height creates a hydraulic gradient through the sampler. The orifice diameter of the tubes prohibits sample entry while the sampler is descending. This occurs because friction due to the surface tension of water prohibits water entry/air loss through the narrow tubes during descent. Once the sampler stops at the desired depth, water pushes through the shorter tube and spills into the 40 mL VOC sample vial or polyethylene sampling bottle while air exits the longer exhaust tube. When all the air is pushed out of the sampler by water, the sampler is retrieved. No water from upper levels in the well can displace the water already in the full sampler during retrieval. Once out of the well, the lid is removed, and the sample vial or bottle is removed from the inside of the lid. The vial or bottle is capped using a patented conic lid that removes all head space. Excess water within the KABIS[®] Samplers was used to obtain water quality parameters, specifically temperature, pH, specific conductivity, and turbidity.

Ten samples were taken from well D-18 using Model-III KABIS[®] Samplers on October 11, 2005, approximately 1 week after the PDB samplers had been pulled, at the same depths that the PDB samples had been collected. The week period between sampling events was considered sufficient time to achieve a re-equilibration of the water chemistry within the well. The six primary groundwater samples were assigned sample identifiers D-18GW001 through D-18GW006; one primary was taken from each discrete sample depth. Four quality control samples were taken from the shallowest sample depth (155 ft bgs) and were assigned sample identifiers D-18FD001, D-18MS001, D-18SD001, and D-18FR001.

After the sample containers were filled, they were placed into an ice-chilled cooler and shipped overnight to STL, a State of Utah and USACE-certified analytical laboratory, for VOC analysis. Chain-of-custody forms were filled out and used to document the sampling dates, analytical parameters requested, and proper sample handling. Completed chain-of-custody forms and cooler receipt forms are included in Appendix F.

6.2 GROUNDWATER ANALYTICAL RESULTS

Six primary groundwater samples were collected from monitoring well D-18 at depths of 155, 165, 175, 180, 192, and 205 ft bgs using PDB samplers. Two VOC analytes were detected in samples from this well. The VOC sampling results from monitoring well D-18 are summarized in Table 1. The EPA Federal Maximum Contaminant Levels (MCLs) are provided in that table as a basis of comparison. TCE was detected above the reporting limit (RL) (5 µg/L) from the

shallowest depth sample. A slight decrease in TCE concentrations is observed from the shallowest to the deepest sample depth in well D-18. Very low concentrations (0.15 -0.16 µg/L) of carbon tetrachloride (CTC) were also detected at two depths (175 and 192 ft bgs).

The reported TCE concentration of 5 µg/L for the shallowest groundwater sample, in conjunction with somewhat lower concentrations at greater depths, indicates that the margin of the NEB TCE Plume (as designated by the 5 µg/L isoconcentration contour) is approximately defined at this location by monitoring well D-18. The difference in TCE concentrations as a function of depth may be statistically significant, but it cannot be attributed to any water chemistry stratification owing to the presence of a semi-confining condition at this location. Rather, if the decrease in TCE with depth is valid, then it is posited to represent the concentration gradient under an upward hydraulic gradient.

The water quality analyses derived from the KABI[®] sampling are presented in Table 2. Concentration data are provided for the cations calcium, potassium, sodium, and magnesium; the anions chloride and sulfate; and total alkalinity. All concentration values are reported in milligrams per liter (mg/L).

There is little difference within this set of samples between the lowest and highest reported concentrations for sodium, sulfate, and total alkalinity. Moreover, it is questionable whether that difference is statistically significant, as the relative percent difference (RPD) between the lowest and highest values for those parameters is <10%. Chloride and potassium concentrations are also very consistent excluding the results at 155 and 192 ft, respectively. Conversely, reported concentrations for calcium, and possibly magnesium, are notably higher at depths of 192 and 205 ft relative to the shallower KABIS[®] sample depths.

As mentioned above, water quality parameters were recorded for each of the KABIS[®] samplers. The results are contained in the Veolia Water sampling field notes presented in Appendix E. With the exception of turbidity, the parameters show little variation between the maximum and minimum values reported. Arithmetic means for pH, temperature, and conductivity are: 7.81 pH, 54.8 degrees Fahrenheit, and 1208 µS/cm. All recorded values are within 1.3% of the calculated mean for each parameter. Turbidity values gradually increase with depth; the maximum value was 322 NTUs.

With the exception of calcium, and to a lesser extent magnesium, the consistency of ion concentrations reported, and of the water quality parameters measured, suggests that if two hydraulically isolated water-bearing zones were intersected during drilling, complete mixing of those waters had occurred within the well casing prior to KABIS[®] sampling. The elevated concentrations of calcium and magnesium at 192 and 205 ft bgs occur within the semi-confined water-bearing zone that was initially encountered at a depth of about 185 ft bgs. The results for these cations imply some stratification based on water chemistry. Although the calcium

concentration at 175 ft is slightly elevated relative to the values reported for the samples collected immediately above (165 ft) and below (180 ft), the difference is thought to reflect analytical precision rather than the possibility of another water-bearing zone at that depth.

Collectively, the bulk of the major ion concentration values for D-18 show very close agreement with the water quality analysis reported for nearby monitoring well D-8 (Table 3). The latter data were generated from the well installation sampling event in Spring 2001. Field-measured conductivity data recorded for D-18 are similar to those obtained for D-8. Groundwater from both wells is designated as type 3 owing to chloride: alkalinity ratios that exceed 1.0. Higher concentrations of potassium (5.7 mg/L) and calcium (158 and 164 mg/L), and lower concentrations of total alkalinity (assumed to consist chiefly of bicarbonate alkalinity) in D-18 may reflect minor mixing of fault-derived (?) thermal groundwater (type 3 ?) with type 1 or 2 groundwater. Similar mixing is posited to have occurred in monitoring wells D-3 and D-8. Alternatively, the appreciably higher calcium and magnesium concentrations in groundwater at the bottom of the well may be due to the strongly caliche-cemented zone at 195-198 ft bgs. The relatively low chloride and sodium concentrations reported in D-18 indicate any contribution by geothermal waters is very minor. In summary, the major ion chemistry supports the hydrogeologic observations and borehole log that indicate a single semi-confined water-bearing zone was intersected between about 185 ft and the bottom of the boring.

Laboratory reports for the groundwater analyses from D-18 are included in Appendix F.

TABLE 1

SUMMARY OF LABORATORY RESULTS – VOLATILE ORGANIC COMPOUNDS

TOOELE ARMY DEPOT, UTAH

Analyte Sample Number & Depth	Federal MCL (µg/L) 95 40CFR 141.11, 141.12, 141.61, & 141.62	Analytical Results (µg/L)					
		D-18GW007 (155 ft)	D-18GW008 (165 ft)	D-18GW009 (175 ft)	D-18GW0010 (180 ft)	D-18GW0011 (192 ft)	D-18GW0012 (205 ft)
1,1,1 Trichloroethane	200	ND	ND	ND	ND	ND	ND
1,1,2 Trichloroethane	5	ND	ND	ND	ND	ND	ND
1,1 Dichloroethane	5	ND	ND	ND	ND	ND	ND
1,1 Dichloroethene		ND	ND	ND	ND	ND	ND
1,2 Dichloroethane	5	ND	ND	ND	ND	ND	ND
1,2 Dichloropropane	5	ND	ND	ND	ND	ND	ND
Benzene	5	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	5	ND	ND	0.15J	ND	0.16J	ND
Chloroethane		ND	ND	ND	ND	ND	ND
Chloroform	100	ND	ND	ND	ND	ND	ND
cis 1,2 Dichloroethene		ND	ND	ND	ND	ND	ND
Ethylbenzene	700	ND	ND	ND	ND	ND	ND
m,p Xylene	10,000	ND	ND	ND	ND	ND	ND
Methylene chloride	3	ND	ND	ND	ND	ND	ND
Naphthalene		ND	ND	ND	ND	ND	ND
o Xylene	10,000	ND	ND	ND	ND	ND	ND
Tetrachloroethene		ND	ND	ND	ND	ND	ND
Toluene	1,000	ND	ND	ND	ND	ND	ND
trans 1,2 Dichloroethene		ND	ND	ND	ND	ND	ND
Trichloroethene	5	5.0	4.4	3.9	3.7	3.8	3.8
Vinyl chloride	2	ND	ND	ND	ND	ND	ND

J = Estimated Result. Result is less than reporting limit.

TABLE 2

SUMMARY OF LABORATORY RESULTS – ANIONS, CATIONS, AND ALKALINITY

TOOELE ARMY DEPOT, UTAH

Analyte	Analytical Results (mg/L)						
Sample Number & Depth	D-18GW001 (155 ft)	D-18FD001 (155 ft)	D-18GW002 (165 ft)	D-18GW003 (175 ft)	D-18GW004 (180 ft)	D-18GW005 (192 ft)	D-18GW006 (205 ft)
Sodium	88.5J	89.8J	83.2J	86.5J	86.8J	90.7J	86.6J
Chloride	295Q	295Q	283Q	281Q	282Q	283Q	282Q
Sulfate	55.6Q	56.7Q	54.6Q	53.0Q	52.9Q	53.5Q	53.0Q
Calcium	101J	102J	106J	121J	107J	158J	164J
Potassium	4.0	4.1	4.0	4.1	4.0	5.7	4.4
Magnesium	39.5	40.4	39.2	40.6	39.7	46.4	42.4
Total Alkalinity	160	160	161	162	174	159	161

J = Method Blank Contamination. The associated method blank contains the target analyte at a reportable level.

Q = Elevated Reporting Limit. The reporting limit is elevated due to high analyte levels.

TABLE 3**MAJOR AND SELECTED MINOR ION ANALYSES PHASE I RFI OFFSITE MONITORING WELLS
NORTHEAST BOUNDARY GROUNDWATER INVESTIGATION INSTALLATION SAMPLING EVENT**

	D-1	D-2	D-3	D-4	D-5	D-6	D-7	D-8	D-9	D-10
Bromide	ND	ND	0.767	ND	ND	ND	ND	ND	ND	ND
Calcium	81.6	73	138	89.6	107	113	93.5	105	439	25.9
Chloride	125	79.2	404	142	218	197	177	277	7290	393
Fluoride	0.21	0.2	0.21	0.24	0.2	0.27	0.266	0.46	2.75	0.709
Magnesium	29.1	23.9	56.6	35.1	40.8	40.3	34.6	42.8	134	9.9
Nitrate	3.1	3.8	9.4	3.7	4.7	8.5	4.5	3.81	1.9	1.52
Potassium	2.39	1.67	5.05	3.35	3.2	2.84	2.94	3.57	50.2	4
Sodium	62.3	57.2	151	62.5	70.1	81.3	75.3	81.1	4110	305
Sulfate	41	36.7	93.3	40.4	52.6	65.5	56.5	49.4	196	43.3
Bicarbonate	292.4	309.2	288.9	319.9	274	335	280.4	210.1	190	210

1. All concentrations reported in mg/L.
 2. Analyses were performed on unfiltered samples, thus all results represent total concentrations.
 3. Bicarbonate concentrations were back calculated, and assume that total alkalinity = bicarbonate alkalinity.
- ND = Not Detected

7. INSTALLATION RESTORATION WASTE

7.1 DECONTAMINATION METHODS

To help minimize the chance that non-dedicated equipment could cross-contaminate groundwater or sediment at well D-18, a rigorous decontamination program was followed. A decontamination station was constructed in the temporary UID RCRA 90-day yard (located south of Building 614) that could accommodate the drill rig, drill pipe, and other equipment as needed. Decontamination of equipment was conducted with approved water from TEAD production well WW-3 using a steam cleaner/high-pressure washer. Equipment wash and rinse water was contained in a sump within the decontamination pad, and pumped to a Baker Tank (Parsons container #PARSNZ0518101) that was labeled as hazardous waste. This tank was located within the UID 90-day yard. The wastewater was held in the tank for later disposal pending characterization of the liquid waste stream.

7.2 DISPOSAL OF DRILL CUTTINGS

Drill cuttings in the unsaturated zone were collected below the cyclone in a wheelbarrow and spread evenly on the ground around the well site. Once groundwater was encountered, saturated cuttings and any free groundwater were containerized in 55-gallon drums and transported to the UID 90-day yard via Uniform Hazardous Waste Manifest P5008 by MP Environmental Services. A saturated sample was collected every 5 ft and, upon completion of the borehole, these samples were composited to a single sample and submitted for laboratory analysis for VOCs. Lab results indicated VOCs were not detected in the cuttings from well D-18. Following TEAD approval, the cuttings were returned to the site of D-18 and spread evenly on the ground surface. A copy of the laboratory results is included in Appendix G.

7.3 DISPOSAL OF WASTEWATER

Water derived from the development of well D-18, including equipment rinse water, was transported from the well site to the UID temporary 90-day yard via Uniform Hazardous Waste Manifest P5011 by MP Environmental Services, utilizing a 5,000 gallon capacity tanker truck, and pumped into a 6,500 gallon capacity Baker Tank. (Parsons container #PARSNZ0518101) that already contained wastewater from the drilling, installation, and development of monitoring well D-17.

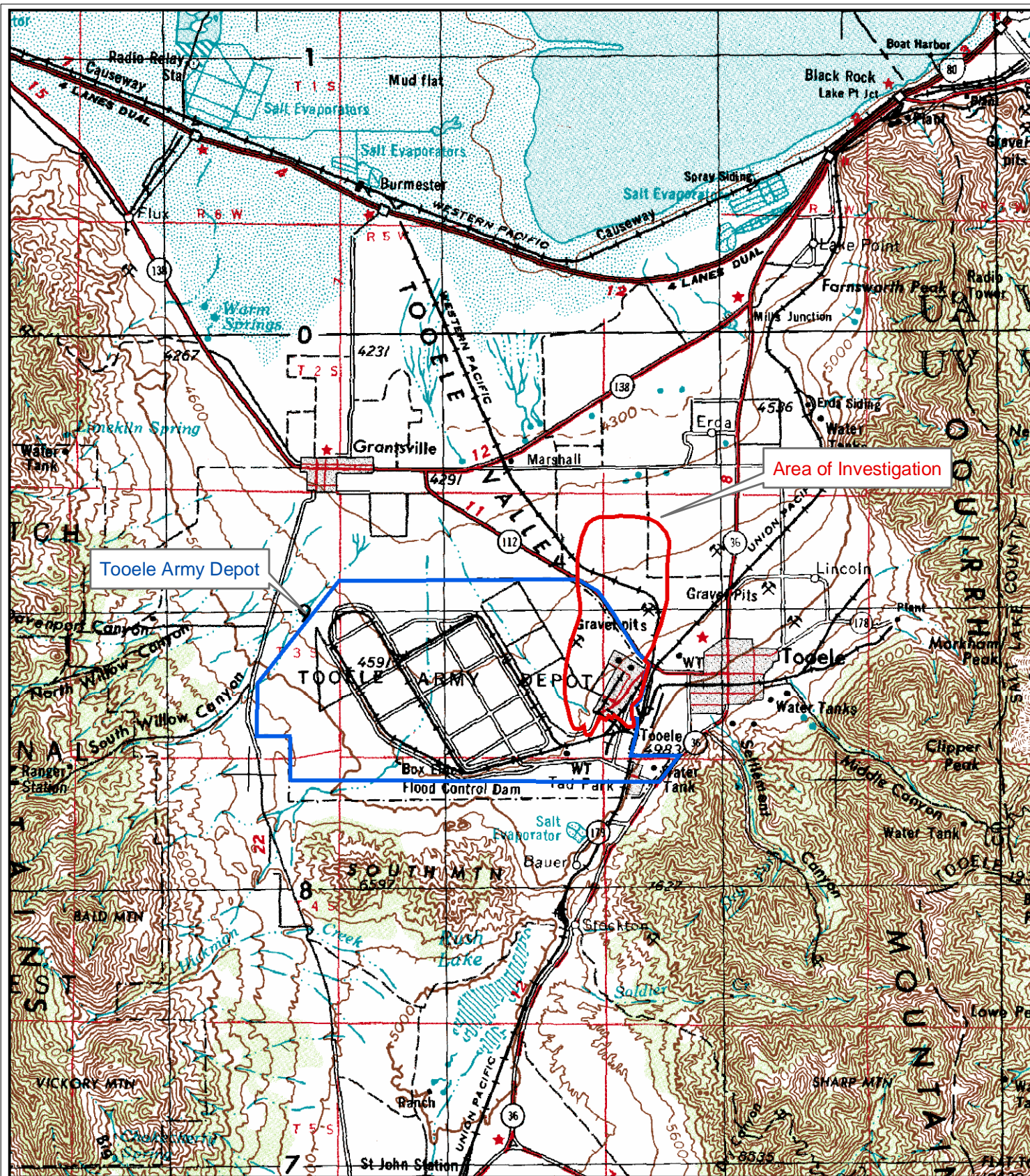
Eventually development, drilling, and equipment rinse water derived from nearby well D-19 was also commingled in this 6,500-gallon capacity Baker Tank. Commingling of the waste streams from these three D-series wells was justified because they lie on the perimeter of the NEB

Plume. Consequently, for IRW management purposes, it was assumed the development water from these wells would be impacted by low-level chlorinated solvents and have similar waste characteristics.

After development and decontamination water from well D-19 was added to the tank, it was closed and sampled to determine the most suitable disposal option for this waste stream. Sample IDW57 contained 0.41 µg/L TCE, 0.18 µg/L chloroform, and 0.35 µg/L CTC. The waste was coded as F001 and F002 hazardous. Based on this analysis, the water met the requirements for processing at the TEAD GWTP, and this disposal option was recommended to TEAD. A copy of the disposal recommendation memo and TEAD's response are included in Appendix H. Following authorization by TEAD, the waste was transferred to the TEAD groundwater treatment plant on September 18, 2005, via a 5,000-gallon capacity tanker provided by MP Environmental.

8. REFERENCES

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LEGEND

- Installation Boundary
- Investigation Boundary

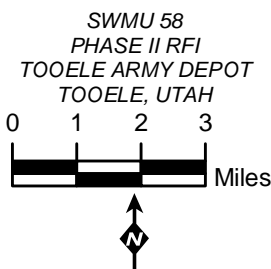
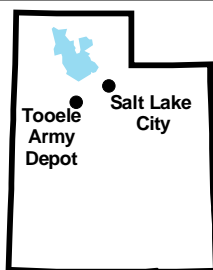


FIGURE 1.1
SITE
LOCATION
MAP

Source: USGS Tooele, Utah 1 x 2 Quadrangle, 1970

APPENDIX A

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS

PROJECT: Tooele Army Depot
Groundwater Monitoring Wells

LAND LEASE

BETWEEN

PERRY/TOOELE ASSOCIATES, LLC

AND

THE UNITED STATES OF AMERICA

THIS LEASE, made and entered into this 28th day of April, 2005, by and between Perry/Tooele Associates, Limited Partners, whose address is 416 W. 2000 North, Tooele, Utah 84074 and whose interest in the property hereinafter described is that of owner for its heirs, executors, administrators, successors, and assigns, hereinafter called Lessor, and THE UNITED STATES OF AMERICA, hereinafter called the Government:

WHEREAS, Tooele Army Depot was placed on the Environmental Protection Administration's (EPA) National Priorities List in October 1990. Several known and potential waste sites on the installation were designated as sites for environmental study and possible cleanup under Comprehensive Environmental Response, Compensation & Liability Act, in accordance with a 1991 agreement between the Army, the EPA, and the Utah Department of Environmental Quality.

WHEREAS, the Government approached the Lessor for a Right of Entry for the construction and access to groundwater monitoring well, and the Lessor agreed by accepting the Right of Entry on December 12, 2000.

WHEREAS, the Government installed a groundwater monitoring well located on Parcel #3-10-2 (Well #D-8) in December 2000 and by request from the Lessor to decommission the well, the Government abandoned Well #D-8 in February 2003.

[Handwritten signature]
4-28-05

WHEREAS, the Government is proposing to lease certain property until final placement of three wells on the Lessor's property is determined and all appropriate information is acquired to make formal offer to purchase easements for all three new well sites.

NOW THEREFORE, the Lessor hereby leases to the Government the following described premises, portions of Parcels #3-10-2 (Well #D-17) and #2-138-2 (Wells #D-18 & #D-19), as shown in Exhibit "A" attached hereto and made a part hereof (hereinafter the Property), to be used for the construction of three groundwater monitoring wells and for monitoring and sampling the groundwater for contaminants.

TO HAVE AND TO HOLD the Property for the term beginning November 1, 2004 through October 31, 2005, provided that unless and until the Government shall give notice of termination in accordance with provision 5 hereof, this Lease shall remain in force thereafter from year to year without further notice; provided further that adequate appropriations are available from year to year for the payment of rentals; and provided further that this Lease shall in no event extend beyond October 31, 2007.

1. Compensation:

a. For use of the Parcel #3-10-2 (Well #D-8) from December 15, 2000 to February 27, 2003, a lump sum of \$3,348.43 (\$2,904.16 and interest of \$444.27). The sum will be paid upon execution of this Lease.

b. Beginning upon execution of this Lease, annual rent of \$2,550.00 will be paid in arrears at the rate of \$850.00 per annum, per well. Payment shall be made at the end of each fiscal year (30 September), by the U.S. Army Corps of Engineers, Finance and Accounting Office, Special Disbursing Agent, 1325 J Street, Sacramento, California 95814-2922.

c. All compensation paid under this Lease will be credited towards the Government's payment for the compensation agreed upon for the price of the easement.

2. The Government and the Lessor agree to enter into discussions on placement of the three new well sites located on Parcels #3-10-2 (Well #D-17) and #2-138-2 (Wells #D-18 & D-19) as required by the State of Utah. As part of these discussions, the Lessor shall allow the Government and its contractors access to the Property and upon agreement of the sites, this Lease will be amended by Supplemental Agreement to allow for construction of the wells. The Government further agrees upon construction of the wells, it will make an offer to buy a 30-year easement for all three groundwater well sites, prior to the termination of this Lease. Upon execution of an easement, this Lease will terminate.

3. The Government shall have the right, during the existence of this Lease to attach fixtures, and erect structures or signs, in or upon the Property, which fixtures and structures, or signs so placed in, upon or attached to the Property shall be and remain the property of the Government and may be removed or otherwise disposed of by the Government.

4. The Government has the right of ingress/egress in, on, over, and across said Property for the use by the Government, its representatives, agents, and contractors.

5. The Government may terminate this Lease at any time by giving thirty (30) days notice in writing to the Lessor, and no rental shall accrue after the effective date of termination.

6. Any notice under the terms of this Lease shall be in writing signed by a duly authorized representative of the party giving such notice, and if given by the Government shall be addressed to the Lessor at 416 West 2000 North, Tooele, Utah 84074, and if given by the Lessor, shall be addressed to U.S. Army Corps of Engineers, Real Estate Division, 1325 J Street, Sacramento, California 95814-2922.

7. The Lessor warrants that no person or selling agency has been employed or retained to solicit or secure this Lease upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees or bona fide established commercial or selling agencies maintained by the Lessor for the purpose of securing business. For breach or violation of this warranty the Government shall have the right to annul this Lease without liability or in its discretion to deduct from the Lease price or consideration the full amount of such commission, percentage, brokerage, or contingent fee.

8. No Member of or Delegate to Congress or Resident Commissioner shall be admitted to any share or part of this Lease or to any benefit that may arise therefrom, but this provision shall not be construed to extend to this Lease if made with a corporation for its general benefit.

9.a. The Government may, by written notice to the Lessor, terminate the right of the Lessor to proceed under this Lease if it is found, after notice and hearing, by the Secretary of the Army or his duly authorized representative, that gratuities (in the form of entertainment, gifts, or otherwise) were offered or given by the Lessor, or any agent or representative of the Lessor, to any officer or employee of the Government with a view toward securing a lease or securing favorable treatment with respect to the awarding or amending, or the making of any determinations with respect to the performing, of such lease; provided, that the existence of facts upon which the Secretary of the Army or his duly authorized representative makes such findings shall be in issue and may be reviewed in any competent court.

b. In the event this Lease is terminated as provided in paragraph 9.a hereof, the Government shall be entitled (i) to pursue the same remedies against the Lessor as it could pursue in

AKS
4-18-05

the event of a breach of the Lease by the Lessor, and (ii) as a penalty in addition to any other damages to which it may be entitled by law, to exemplary damages in an amount (as determined by the Secretary of the Army or his duly authorized representative) which shall be not less than three nor more than ten times the costs incurred by the Lessor in providing any such gratuities to any such officer or employee.

c. The rights and remedies of the Government provided in this clause shall not be exclusive and are in addition to any other rights and remedies provided by law or under this Lease.

10. The Lessor agrees that the Comptroller General of the United States or any duly authorized representatives shall, until the expiration of three (3) years after final payment of the agreed rental, have access to and the right to examine any directly pertinent books, documents, papers and records of the Lessor involving transactions related to this Lease.

11. If any action of the Government's employees or agents in the exercise of this Lease results in damage to the real property, the Government will, in its sole discretion, either repair such damage or make an appropriate settlement with the Lessor. In no event shall such repair or settlement exceed the fair market value of the fee title to the real property at the time immediately preceding such damage. The Government's liability under this clause is subject to the availability of appropriations for such payment, and nothing contained in this agreement may be considered as implying that Congress will at a later date appropriate funds sufficient to meet any deficiencies. The provisions of this clause are without prejudice to any rights the Lessor may have to make a claim under applicable laws for any damages other than those provided for herein.

{Signatures to follow.}

DMH
4-18-05

IN WITNESS WHEREOF, the parties hereto have hereunto subscribed their names as of the date first above written.

WITNESS MY HAND this 28th day of April, 2005.

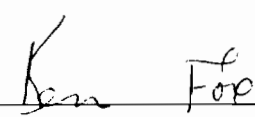
PERRY/TOOELE ASSOCIATES, LLC.

Signature: 


Print Name: DREW D. HALL

ACCEPTED

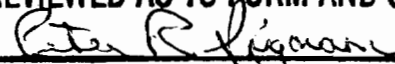
THE UNITED STATES OF AMERICA

for
By: 

MARVIN D. FISHER
Chief, Real Estate Division
U.S. Army Engineer District, Sacramento


4-18-05

REVIEWED AS TO FORM AND CONTENT:


ATTORNEY

LOS ANGE

MARIAN E. LARSEN,
LUCILLE E. REDFORD
&
ELAINE ENGLAND
1/3 EA
3-10-5
109.89 AC

BESSIE E. JENSEN
ETAL
3-10-1
109.94 AC

ANTONETTE T. CASSITY

TOOELE C
2-142-4
30 AC

PRIVATE WELL #2

DONNA MAE SANTORO

3-10-4
110.42 AC

1410000 E

TOOELE ASSOCIATES
3-10-2
160.21AC

● D-17

TOOELE ASS
2-142-2-

TOOELE ASSOCIATES

● D-18

ANTONETTE T. CASSITY
DONNA MAE SANTORO
ETAL 2-138-6

● D-8 (Decom)

● D-19

2-138-2
160.43 AC

BESSIE E. JENSEN
ETAL
2-138-1 53.33 AC

MARIAN E. LARSON
LUCILLE E. REDFORD &
ELAINE ENGLAND Δ H
2-138-7 53.33 AC

STATE OF UTAH

● D-5

2-138-4

STATE OF UTAH
2-138-5
80 AC

● D-7

● D-16

EXHIBIT

TOOELE ASSOCIATES

U.S. 18-25

PARSONS

406 West South Jordan Parkway, Suite 300 • South Jordan, Utah 84095 • (801) 572-5999 • Fax (801) 572-9069 • www.parsons.com

June 2, 2005

State of Utah
Department of Natural Resources
Division of Water Rights
1594 West North Temple
Suite 220
P.O. Box 146300
Salt Lake City, Utah
84114-6300

Attn: Ross Hanson

Subject: Request for authorization to drill groundwater monitoring wells for the Phase II RCRA Facilities Investigation at Tooele Army Depot

Dear Sir:

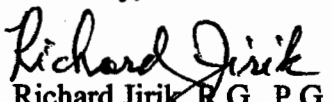
Parsons, on behalf of Tooele Army Depot (TEAD), requests authorization from the Division of Water Rights (DWR) to drill and install three (3) groundwater monitoring wells in Tooele Valley northeast of TEAD and west of Tooele City (see attached table and map figure). Preparations are in progress to drill these wells starting on or after June 20th and finishing by mid-July, 2005.

All well borings will be advanced by a State of Utah licensed well driller using percussion hammer drilling to a maximum depth of about 210 ft. As per other D-series monitoring wells constructed during this program, wells will be constructed using four (4) inch diameter Schedule 40 PVC, each well will extend approximately 40 ft below the regional water table, and a 20-ft 10- or 20-slot PVC well screen will be installed over the bottom 20 ft.

If you have any questions or concerns please contact me at (801) 572-5999.

Written authorization should be mailed to Larry McFarland, SJMTE-CS-EO, 1 Tooele Army Depot (Building 8), Tooele, Utah 84074. His work phone is (435) 833-3235.

Sincerely,


Richard Jirik, R.G., P.G.
Senior Hydrogeologist
Parsons



**LOCATION DATA FOR PROPOSED GROUNDWATER MONITORING WELLS D-17, D-18, AND D-19
NORTHEAST BOUNDARY AREA
PHASE II RFI @ SWMU 58, TOOELE ARMY DEPOT**

Well Identifier	-proposed well location-		-referenced section corner-		-well location relative to		Section Corner	Section	Township	Range	Base	Diameter (inches)	Est Depth (feet)
	State Plane (northing)	State Plane (easting)	State Plane (northing)	State Plane (easting)	North/South Distance (feet)	East/West Distance (feet)							
D-17	7381795	1407267	7380941	1409417	North 854	West 2150	SE	6	3S	4W	SL	4	170
D-18	7380824	1404691	7380941	1404137	South 117	East 554	NW	7	3S	4W	SL	4	180
D-19	7379877	1406331	7380941	1404137	South 1064	East 2194	NW	7	3S	4W	SL	4	200

The state plane coordinates provided in this table for the proposed monitoring wells were derived from staked locations in the field. Coordinates were provided by Ward Engineering of SLC.

DIVISION OF WATER RIGHTS

REQUEST FOR NON-PRODUCTION WELL CONSTRUCTION

(for wells deeper than 30 feet)

Well Type (check one): Provisional () Monitor (X) Cathodic Protection () Heat Exchange ()

Applicants Name: TOOELE ARMY DEPOT

Mailing Address: SJMT-E-PS-EO 1 TOOELE ARMY DEPOT (BLA68)
TOOELE UTAH 84074

Contact Person: MR. LARRY McFARLAND Phone: (435) 833-3504

Proposed Start Date: 6/22/05 Anticipated Completion Date: 7/25/05

Well Drillers License No: 626 Proposed No. of Wells: 3

PROPOSED LOCATION OF WELLS:

County: TOOELE

NO./SQ. DISTANCE (feet)	EAST/WEST DISTANCE (feet)	SECTION CORNER	SECTION	TOWNSHIP	RANGE	BASE	DIAMETER (inches)	DEPTH (feet)
N1000	W1300	W4	15	2S	1W	SL	2	100

Use back of form or additional paper if more room is needed

EXPLANATORY: REFER TO ACCOMPANYING TABLE FOR INFORMATION ON PROPOSED WELLS
LOCATIONS SHOWN ON ENCLOSED FIGURE. ALL WELLS LOCATED OUTSIDE OF THE
NORTHEAST BOUNDARY TCE PLUME, AND WILL SERVE IN A SENTINEL CAPACITY.

Richard Jirik (PARSONS) FOR
 Signature of Applicant LARRY McFARLAND (TOOELE ARMY DEPOT)

JUNE 2, 2005
 Date

FOR OFFICE USE ONLY

Date of Request: _____ Approval Date: _____

Approved by: _____ Provisional/Monitor Well No. _____

Water Right Number (if available): _____



JOHN M. HUNTSMAN, JR.
Governor
GARY R. HERBERT
Lieutenant Governor

State of Utah
DEPARTMENT OF NATURAL RESOURCES
Division of Water Rights

MICHAEL R. STYLER JERRY D. OLDS
Executive Director State Engineer/Division Director

*Cf: File (destination)
Larry McFarland*

TOOELE ARMY DEPOT
SJMTE-CS-E0
1 TOOELE ARMY DEPOT BLDG 8
TOOELE, UT 84074

June 7, 2005

Dear Applicant:

RE: MONITOR WELL#: 0515003M00

Reference is made to your request to drill 3 MONITOR WELL(S). The anticipated drilling depths will exceed the minimum regulated and reporting depth of 30 feet, thereby requiring permission from the Division of Water Rights to proceed with this project.

The specifications outlined in your well project request dated June 7, 2005, meet the State Engineer's requirements and permission is **HEREBY GRANTED**. Therefore, this letter is your authorization to proceed with the construction of the well(s) in accordance with those specifications and with respect to the following provisions:

- 1) Small diameter casing is to be used in the construction of the well(s) and no more water is to be diverted than is necessary to determine the quality of the ground water by obtaining representative samples as required by the project.
- 2) The well(s) must be drilled by a currently licensed Utah driller and must be drilled in a manner consistent with the recommended construction standards cited in the Utah State Administrative Rules for Well Drillers.
- 3) The enclosed Driller (START) Card form must be given to the licensed driller for his submittal prior to commencing well construction. The other enclosed form is the 'Applicant Card.' It is **YOUR RESPONSIBILITY** to sign and return this Applicant Card form to our office upon well completion.
- 4) If complete information is not available in the initial application, it is the **APPLICANT'S RESPONSIBILITY** to provide, upon completion, descriptive locations of the wells referenced by course and distance from established section corners. e.g. North 565 feet and West 1096 feet from the SE corner of Section 35, T2S, R5W, SLB&M.
- 5) At such time as the well(s) are no longer utilized to monitor ground water and the intent of the project is terminated, the well(s) must be temporarily or permanently abandoned in a manner consistent with the Administrative Rules.

NOTE: Please be aware that your permission to proceed with the drilling under this authorization expires December 6, 2005.

Sincerely,

Ross Hansen, P.E.
Regional Engineer

1594 West North Temple, Suite 220, PO Box 146300, Salt Lake City, UT 84114-6300
telephone (801) 538-7240 • facsimile (801) 538-7467 • www.waterrights.utah.gov

APPLICANT CARD for Monitor WELL#: 0515003M00

IMPORTANT: THIS CARD MUST BE COMPLETED, SIGNED AND RETURNED BY THE WELL
OWNER/APPLICANT AS SOON AS THE WELL IS DRILLED BY A LICENSED UTAH WATER
WELL DRILLER.

OWNER/APPLICANT NAME: TOOELE ARMY DEPOT
MAILING ADDRESS: SJMTE-CS-EC, 1 TOOELE ARMY DEPOT BLDG 8, TOOELE, UT 84074
PHONE NUMBER: 435-833-3504
WELL LOCATION: You are authorized to drill 3 Monitor Wells. SEE BELOW.
WELL UTM COORDINATES:
WELL ACTIVITY: NEW ☒ REPAIR () REPLACE () ABANDON ()
CLEAN () DEEPEN ()

WELL COMPLETION DATE: _____

NAME OF DRILLING COMPANY/LICENSEE: _____

Larry M. Furland6-13-04

Owner/Applicant Signature

Date

***COMPLETE. SIGN AND RETURN THIS PORTION UPON FINAL WELL COMPLETION -
DO NOT GIVE THIS CARD TO LICENSED WELL DRILLER - YOU MUST RETURN IT.
STATE OF UTAH DIVISION OF WATER RIGHTS Phone No. 801-538-7416
Fax No. 801-538-7467

COMMENTS: _____

MONITOR WELL LOCATIONS:

- (1) N 854 W 2150 from the SE corner, S06 T 3S R 4W SLBM
- (2) S 117 E 554 from the NW corner, S07 T 3S R 4W SLBM
- (3) S 1064 E 2194 from the NW corner, S07 T 3S R 4W SLBM

START/APPLICANT CARD INSTRUCTIONS: First, for each well, you must give a Driller (Start) Card to the licensed driller with whom you contract to construct the well. Second, it is your responsibility to sign and return this Applicant Card to this office immediately after completion of the well. CAUTION: There may be local health requirements for the actual siting of your well. Please check with the proper local authority before construction begins. See the enclosed sheet addressing construction information.

DRILLER (START) CARD for Monitor WELL#: 0515003M00

IMPORTANT: THIS CARD MUST BE RECEIVED BY THE DIVISION OF WATER RIGHTS PRIOR TO THE BEGINNING OF WELL CONSTRUCTION -- REQUIRED ONLY FOR WELLS DEEPER THAN 30 FT.
 OWNER/APPLICANT NAME: TOOELE ARMY DEPOT
 MAILING ADDRESS: SJMTE-CS-EO. 1 TOOELE ARMY DEPOT BLDG 8. TOOELE. UT 84074
 PHONE NUMBER: 435-833-3504
 WELL LOCATION: You are authorized to drill 3 Monitor Wells. SEE BELOW.
 WELL UTM COORDINATES:
 WELL ACTIVITY: NEW ☒ REPAIR ☐ REPLACE ☐ ABANDON ☐
 CLEAN ☐ DEEPEN ☐

For surface seals in unconsolidated formations (clay, silt, sand, and gravel), will you be using a temporary conductor casing or other formation stabilizer (e.g., drilling mud) in the surface seal interval to maintain the required annular space?

YES or NO (Circle one).

Answering 'NO' suggests that you will be placing the surface seal in an open and unstabilized annular space, which may require onsite inspection of seal placement by the State Engineer's Office.

PROPOSED START DATE: 6-27-05

PROJECTED COMPLETION DATE: 7-27-05

LICENSE #: 626 LICENSEE/COMPANY: Wayne Christensen Co.

08 6-22-05

Licensee Signature

Date

NOTICE TO APPLICANT: THIS CARD IS TO BE GIVEN TO A UTAH LICENSED WATER WELL DRILLER FOR SUBMITTAL TO THE DIVISION OF WATER RIGHTS PRIOR TO WELL CONSTRUCTION.
 STATE OF UTAH DIVISION OF WATER RIGHTS Phone No. 801-538-7416
 Fax No. 801-538-7467

MONITOR WELL LOCATIONS:

- (1) N 854 W 2150 from the SE corner, S06 T 3S R 4W SLBM
- (2) S 117 E 554 from the NW corner, S07 T 3S R 4W SLBM
- (3) S 1064 E 2194 from the NW corner, S07 T 3S R 4W SLBM

D-17
D-18
D-19

WELL DRILLER'S REPORT

State of Utah

Division of Water Rights

For additional space, use "Additional Well Data Form" and attach

Well Identification

Non-Production Well: 0515003M00

WIN: 34326

Овдег

Note any changes

TOOELE ARMY DEPOT
SJMTE-CS-EO
1 TOOELE ARMY DEPOT BLDG 8
TOOELE, UT 84074

Contact Person/Engineer: Richard Jirik / Parsons

Well Location

Note any changes

S 117 E 554 from the NW corner of section 07, Township 3S, Range 4W, SL B&M

Location Description: (address, proximity to buildings, landmarks, ground elevation, local well #) D-18

Drillers Activity

Start Date: June 27, 2005 Completion Date: September 23, 2005

Check all that apply: ☒ New ☐ Repair ☐ Deepen ☐ Clean ☐ Replace ☐ Public Nature of Use: Monitor Well

If a replacement well, provide location of new well. _____ feet north/south and _____ feet east/west of the existing well.

DEPTH (feet) FROM TO		BOREHOLE DIAMETER (in)	DRILLING METHOD	DRILLING FLUID
0	220	9	Percussion Hammer	Air

Well Log

[illegible]

Static Water Level

Date July 6, 2005 Water Level 155 feet Flowing? ☐ Yes ☒ No

Method of Water Level Measurement WLI If Flowing, Capped Pressure N/A PSI

Point to Which Water Level Measurement was Referenced Ground Level Elevation N/A

Height of Water Level reference point above ground surface N/A feet Temperature N/A degrees ☐ C ☐ F

Well Log

Construction Information

DEPTH (feet)		CASING			DEPTH (feet)		SCREEN <input checked="" type="checkbox"/> PERFORATIONS <input type="checkbox"/> OPEN BOTTOM		
FROM	TO	CASING TYPE AND MATERIAL/GRADE	WALL THICK (in)	NOMINAL DIAM. (in)	FROM	TO	SCREEN SLOT SIZE OR PERF SIZE (in)	SCREEN DIAM. OR PERF LENGTH (in)	SCREEN TYPE OR NUMBER PERF (per foot/interval)
0	155	4" sch. 40 PVC	40	4	155	175	.010	4	Factory Slc
175	180	4" sch. 40 PVC	40	4	180	205	.010	4	Factory Slc

Well Head Configuration: Above GradeAccess Port Provided? ☒ Yes ☐ NoCasing Joint Type: Flush ThreadPerforator Used: N/AWas a Surface Seal Installed? ☒ Yes ☐ NoDepth of Surface Seal: 147 feetDrive Shoe? ☒ Yes ☐ NoSurface Seal Material Placement Method: Tremie Bentonite Pellets and Bentonite GroutWas a temporary surface casing used? ☒ Yes ☐ No If yes, depth of casing: 220 feet diameter: 9 inches

DEPTH (feet)		SURFACE SEAL / INTERVAL SEAL / FILTER PACK / PACKER INFORMATION		
FROM	TO	SEAL MATERIAL, FILTER PACK and PACKER TYPE and DESCRIPTION	Quantity of Material Used (if applicable)	GROUT DENSITY (lbs./gal., # bag mix, gal/sack etc.)
0	147	Bentonite Grout	22 Bags	50 lbs each
147	152	Bentonite Pellets	3 Buckets	50 lbs each
152	175	16 - 40 Silica Sand	23 Bags	50 lbs each
175	180	Bentonite Pellets	2 Buckets	50 lbs each
180	212	16 - 40 Silica Sand	24 Bags	50 lbs each

Well Development and Well Yield Test Information

DATE	METHOD	YIELD	Units Check One		DRAWDOWN (ft)	TIME PUMPED (hrs & min)
			GPM	CFS		
	N/A					

Pump (Permanent)Pump Description: N/A

Horsepower: _____ Pump Intake Depth: _____ feet

Approximate Maximum Pumping Rate: _____

Well Disinfected upon Completion? ☐ Yes ☐ No**Comments**

Description of construction activity, additional materials used, problems encountered, extraordinary Circumstances, abandonment procedures. Use additional well data form for more space.

Well Driller Statement

This well was drilled and constructed under my supervision, according to applicable rules and regulations, and this report is complete and correct to the best of my knowledge and belief.

Name LAYNE CHRISTENSEN COMPANYLicense No. 626Signature Date September 28, 2005

(Licensed Well Driller)

APPENDIX B

7/1/05 Friday

weather clear 65-95°, no wind

7:00 Arrive at D-18

7:10 Crew at D-17 cleaning up

7:30 Crew arrives. We do rig inspection and have H's S. Topic: Heat Stress

8:06 Begin drilling @ 0' on D-18

9:35 Drive spoil plugs @ 78'

9:38 Drilling again

9:45 Carl Cole onsite

10:10 @ 100' bgs we must stop drilling because saturated zone is likely around 100' and we must containerize cuttings, and because of the 4th of July Holiday on Monday no one from T&E Environmental will be available to manifest cuttings that must be transported to the 90-Day yard within 72 hrs.

10:30 Kurt calls. He is at the 90-Day yard building the partition fence and he is having our "water dog" fire suppression trailer replaced with a larger one. Tom and Jake will drive it over. They have called Layne shop to have a well protector sent out for install today so the horses on site don't break the casing or their leg on the open hole.

Carl leaves site

12:40 Crew has added 1 bag of bentonite chips to D-17 which brings top of grout to 3 bgs. They then dig out hole a bit, slide 6' long 10" diameter steel casing into hole and grout in place using 4 bags portland cement (100 lb bags). Casing is 3' below ground and 3 feet above. They place a lid on casing as well. Carl Cole will provide lock

14:10 Crew goes to 90 Day to get drum truck & move drums

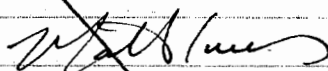
15:07 Drums delivered. All hands offsite

20/att/lin 7/1/05

7/6/05 Wednesday

weather partly cloudy 70-90° 10 mph
wind to NW

- 6:30 I arrive at Field office
- 7:20 Crew and I arrive at D-18. We have H&S tailgate
Topic: Drum handling hazards
- 7:35 Tom and I do rig inspection. I calibration check PM. 103.4
- 8:01 We set up secondary containment and begin drilling
at 100' bgs
- 10:15 Kurt Alloway onsite with the new water wagon for fire
suppression. We are at ~150' bgs with no sign of water
- 11:10 At 177' bgs a fuel line to the head breaks. I take a
water level - still bone dry
- 12:51 @ 194' the head is overheating. Crew shuts down
I run to the 90-Day yards for more drums
- 13:30 Back at D-18 with 5 drums. Carl Cole onsite.
- 13:58 Begin drilling @ 194 we see big water immediately after
a few feet and seal off again. Likely collected while down.
- 15:23 We have drilled to 220 and still sound no water
in hole bottom. Best production zone was
201 to 204' bgs. Clay from 212 produces nothing
I suggest we pull off 3-10 ft casing sections and
let water infiltrate and take water level
- 16:04 Casing backed off to 190. Carl Cole offsite
- 16:12 Water Level = 138.4 ft. We will let well sit
overnight to see if it comes up further
Crew cleans up site
- 16:50 Crew offsite. I head to field office
- 17:35 I leave TEAD



7/6/05

7/7/05 Thursday

weather: clear 70-95° no wind

- 7:05 I arrive at D-18 and take Water Level
W.L. = 138.4 ft bgs. No change overnight
Crew and Carl Cole are in hazardous waste training class this morning until 10:00 am.
I return to Parsons field office to work on boring logs
- 9:25 I speak with Richard Jurik and Ed Staes about well construction. They will speak with Carl & Mary Ellen McKenzie and get back to me
- 9:45 Tom and Jake arrive at office. While waiting for decision they will go to rig, pick up pump return to 90 day yard and pump free water from the drums PARSNZOS18003 thru 08 into the Baker Tank leaving the remaining still in drums
- 12:30 Crew has returned from 90-day. I have faxed borehole log to Richard to forward to the USACE (v11:10) for review to decide how to construct well. We are awaiting instruction
- 12:50 Richard calls to say that he is sure any construction will begin at 205' bgs so crew can go to well and sand in bottom to 206. Crew says hole has caved to 212. Crew heads to D-18 following our tailgate H&S lecture
Topic: ~~Drum Moving Hazards~~ MI PPE handling water
- 14:50 I arrive at site & do rig inspection
- 15:10 Before we are able to sand in well bottom Kirt calls to say MP will be at Sheep Lane at 3:00 to pickup drums. We tie down & head out
- 15:40 MP arrives and begins loading 12 drums. PARSNZOS18701-12
- 16:05 Larry McFarland and Dean Reynolds arrive
- 16:15 Because Kirt is onsite I head back to field office for daily paper work. Manifest # P5008
- 17:10 Offsite

[Signature] 7/7/05

7/8/05 Friday

Weather clear 90-100°

6:40 I arrive at site and take water level. Wind 10 mph to NW
 W.L. = 138.4' (D-18)

7:00 Tom and Jake arrive and sound bottom. Still 212.0'
 They will build well as is with casing to 190 and open hole to 212 so as not to generate additional hazardous waste. Crew will sand bottom of borehole up to 206'

7:10 We do rig inspection and have H&S tailgate

7:25 Begin sanding well. From 212 to 206 is 6 feet
 Borehole volume for a 9" borehole is 0.44 ft^3
 per ft of borehole $6 \times 0.44 = 2.64 \text{ ft}^3$ (as per page 48)
 A sand bag (50 lb Colorado silica) is $\sim .5 \text{ ft}^3$
 $2.64 / .5 = 5.2$ bags

7:55 It took 7 bags to get to 206 so hole is somewhat larger than 9" due to drilling & casing walls
 Crew begins constructing well. We were told by USACE to screen 205 to 180, blank 180 to 175, screen 175 to 155, blank to surface

8:23 Casing is lowered to 205 as above. First sand interval is 206 to 180 = 26 feet: as per page 48
 a 9" hole with a 4" well is $0.35 \text{ ft}^3 / \text{ft of annulus}$
 $26 \times 0.35 = 9.1 \text{ ft}^3 / .5 \text{ ft}^3 / \text{bag} = 18.2$ bags

Crew begins pouring 16/40 Colorado silica from surface

9:14 16 bags in hole. Tom removes 10' of casing to bring casing to 180' bgs while keeping ~~sand~~ top of sand inside casing

10:26 22 bags in hole. Top of Sand @ 182' Carl Cole onsite

10:45 23 bag in hole Top of Sand @ 179.4'. Begin adding seal

11:06 3 buckets (5 gallons) of $\frac{1}{4}$ " Cetco coated bentonite pellets bring top of seal to 175.7' Drillers add sand and pull casing to 170'

11:26 Crew will now sand from 175.7 to 152 = 23.7'
 $23.7 \times 0.35 = 8.3 \text{ ft}^3 / .5 \text{ ft}^3 / \text{bag} = 16.6$ bags

11:45 Carl Cole offsite. Layne guy delivering more sand to site.

12:44 Top of sand at 151.7' using 17 bags. Crew now adds 2 buckets of coated bentonite pellets

7/8/05 Friday (cont)

13:03 Top of seal at 147.6. We will let pellets hydrate. We have some cleanup work in the 90-day yard and need some bases from there for grouting.

• So off we go

14:20 Return from 90-day yard and set up grout plant

14:30 Begin grouting mixing batches of 2-50 lb bags of Pure Gold Powdered Bentonite grout to 28 gallons water to produce 4.4 ft^3 of grout containing 30% solids. I collect a jar sample for Carl Cole to observe once set up. We are filling 148 feet of borehole so $148' \times 0.35 \text{ ft}^3/\text{ft of borehole} = 51.8 \text{ ft}^3$. Each bag yields $4.4 \text{ ft}^3/2 = 2.2 \text{ ft}^3$. $\therefore 51.8 \text{ ft}^3 / 2.2 \text{ ft}^3/\text{bag} = 23.5$ bags.

16:50 Hole is grouted to the surface using 22 bags grout. This may indicate slightly less than 30% solids but the SOW calls for 18-20% so we should be o.k. Tom & Jake clean up site for the weekend.

17:20 Richard indicates he would like surface completions for D-17 & D-18 done before moving on. I will go to job w Breka Monday morn but check back here in afternoon.

17:45 Off site.

W. C. Blum
7/8/05

7/11/05 Monday

weather: clear 80-90° no wind

- 12:20 I arrive at TEAD Field office. Tom Kern & Jake Smith (Layne) are onsite with Kurt Alloway. They are picking up more cement as they have finished surface completion at D-18 and need to drill for and cement in ballards at D-17. We head to D-17.
- 13:50 We drive T posts in around ballards and will rope off area so cows don't effect new concrete overnight. Crew works to set ballards at D-17.
- 16:45 Crew will finish D-17, paint D-18 & D-19. Decon pipe truck and mob to D-19 tomorrow so we can begin pulling Wed morning. I will stay in office and work on well reports.
- 17:17 Leave TEAD field office.

Matt Layne 7/11/05

FIELD ACTIVITY REPORT

Project Number/WBS: <u>744139-20010</u>		Date: <u>7/1/05</u>		
Site: <u>SWMU 58</u>		Arrival Time: <u>7:00</u>		
Team Leader: <u>Richard Jurik</u>		Departure Time \ Destination: <u>15:07</u>		
Team Members: <u>Matt Ivers, Kurt Allaway</u> Weather: <u>clear 65-95° no wind</u>				
Purpose: (Attach all appropriate forms) <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <input type="checkbox"/> Geophysical Survey <input type="checkbox"/> Soil Gas Survey <input type="checkbox"/> Hydropunch <input type="checkbox"/> Test Pit <input type="checkbox"/> GPS <input type="checkbox"/> CPT <input type="checkbox"/> Other (specify) _____ </td> <td style="width: 50%; vertical-align: top;"> <input type="checkbox"/> Well Installation <u>D-18</u> <input type="checkbox"/> Well Development _____ <input type="checkbox"/> Microwell Sampling <input type="checkbox"/> Monitor Well Sampling <input type="checkbox"/> Vertical Boring <input type="checkbox"/> Angle Boring <input type="checkbox"/> Hand Auger <input type="checkbox"/> Surface Soil Sampling </td> </tr> </table>			<input type="checkbox"/> Geophysical Survey <input type="checkbox"/> Soil Gas Survey <input type="checkbox"/> Hydropunch <input type="checkbox"/> Test Pit <input type="checkbox"/> GPS <input type="checkbox"/> CPT <input type="checkbox"/> Other (specify) _____	<input type="checkbox"/> Well Installation <u>D-18</u> <input type="checkbox"/> Well Development _____ <input type="checkbox"/> Microwell Sampling <input type="checkbox"/> Monitor Well Sampling <input type="checkbox"/> Vertical Boring <input type="checkbox"/> Angle Boring <input type="checkbox"/> Hand Auger <input type="checkbox"/> Surface Soil Sampling
<input type="checkbox"/> Geophysical Survey <input type="checkbox"/> Soil Gas Survey <input type="checkbox"/> Hydropunch <input type="checkbox"/> Test Pit <input type="checkbox"/> GPS <input type="checkbox"/> CPT <input type="checkbox"/> Other (specify) _____	<input type="checkbox"/> Well Installation <u>D-18</u> <input type="checkbox"/> Well Development _____ <input type="checkbox"/> Microwell Sampling <input type="checkbox"/> Monitor Well Sampling <input type="checkbox"/> Vertical Boring <input type="checkbox"/> Angle Boring <input type="checkbox"/> Hand Auger <input type="checkbox"/> Surface Soil Sampling			
Protection Level: <input checked="" type="checkbox"/> D <input type="checkbox"/> C <input type="checkbox"/> B <input type="checkbox"/> A				
Health and Safety Briefing: Time <u>7:30</u> People Present <u>Matt Ivers, Tom Kern, Jake Smith</u>				
Topics Discussed: <u>Heat Stress</u>				
Logbook		Book # <u>B071503</u> Page # <u>142</u>		
Photos	Camera # _____	Roll # _____ Frame # _____		
IDW Drums: Purge / Rinse / Soil Drum Number(s): <u>ES</u>				
Closed?: <u>Y / N</u>		Current Location: _____ Update DITF?: <u>Y / N</u>		
Notes: <u>7:00 Arrive at D-18 7:30 Rig inspection + H&S talk etc.</u> <u>8:06 Begin drilling D-18 from surface 10:10 100' bgs. Stop</u> <u>drilling as we are unable to manifest waste without Larry</u> <u>until Tuesday 12:40 Crew installs protective casing on</u> <u>D-17 1 bag chips 4 bag portland 14:10 Crew brings drum</u> <u>truck out to D-18 with drums. 15:07 All hands</u> <u>outside</u>				

FIELD ACTIVITY REPORT

Project Number/WBS: <u>744139-20010</u>		Date: <u>7/6/05</u>		
Site: <u>SWMU 58</u>		Arrival Time: <u>6:30</u>		
Team Leader: <u>Richard Jurik</u>		Departure Time \ Destination: <u>17:35</u>		
Team Members: <u>Matt Ivers, Kurt Alloway</u> Weather: <u>partly cloudy 70-90° 10 mph to NW</u>				
Purpose: (Attach all appropriate forms) <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <input type="checkbox"/> Geophysical Survey <input type="checkbox"/> Soil Gas Survey <input type="checkbox"/> Hydropunch <input type="checkbox"/> Test Pit <input type="checkbox"/> GPS <input type="checkbox"/> CPT <input type="checkbox"/> Other (specify) _____ </td> <td style="width: 50%; vertical-align: top;"> <input checked="" type="checkbox"/> Well Installation <u>D-18</u> <input type="checkbox"/> Well Development _____ <input type="checkbox"/> Microwell Sampling <input type="checkbox"/> Monitor Well Sampling <input type="checkbox"/> Vertical Boring <input type="checkbox"/> Angle Boring <input type="checkbox"/> Hand Auger <input type="checkbox"/> Surface Soil Sampling </td> </tr> </table>			<input type="checkbox"/> Geophysical Survey <input type="checkbox"/> Soil Gas Survey <input type="checkbox"/> Hydropunch <input type="checkbox"/> Test Pit <input type="checkbox"/> GPS <input type="checkbox"/> CPT <input type="checkbox"/> Other (specify) _____	<input checked="" type="checkbox"/> Well Installation <u>D-18</u> <input type="checkbox"/> Well Development _____ <input type="checkbox"/> Microwell Sampling <input type="checkbox"/> Monitor Well Sampling <input type="checkbox"/> Vertical Boring <input type="checkbox"/> Angle Boring <input type="checkbox"/> Hand Auger <input type="checkbox"/> Surface Soil Sampling
<input type="checkbox"/> Geophysical Survey <input type="checkbox"/> Soil Gas Survey <input type="checkbox"/> Hydropunch <input type="checkbox"/> Test Pit <input type="checkbox"/> GPS <input type="checkbox"/> CPT <input type="checkbox"/> Other (specify) _____	<input checked="" type="checkbox"/> Well Installation <u>D-18</u> <input type="checkbox"/> Well Development _____ <input type="checkbox"/> Microwell Sampling <input type="checkbox"/> Monitor Well Sampling <input type="checkbox"/> Vertical Boring <input type="checkbox"/> Angle Boring <input type="checkbox"/> Hand Auger <input type="checkbox"/> Surface Soil Sampling			
Protection Level: <input checked="" type="checkbox"/> D <input type="checkbox"/> C <input type="checkbox"/> B <input type="checkbox"/> A				
Health and Safety Briefing: Time <u>7:20</u> People Present <u>Matt Ivers, Tom Kern, Jake Smith</u>				
Topics Discussed: <u>Drum handling hazards</u>				
Logbook		Book # <u>B071503</u> Page # <u>143</u>		
Photos	Camera # _____	Roll # _____ Frame # _____		
IDW Drums: Purge / Rinse / Soil Drum Number(s): ES				
Closed?: Y / N		Current Location: _____ Update DITF?: Y / N		
Notes: <u>6:30 I arrive at field office 7:20 We arrive at D-18. We have H&S tailgate 7:35 Tom and I do rig inspection 8:01 Set up secondary containment begin drilling 10:15 Kurt brings water wagon 11:10 Fuel line breaks @ 177' / take water level - Dry 12:51 Hears overheating @ 194 hears overheating. I go for drums to 90-Day 13:30 Back at site Carl Cole outside 13:58 Pulling 15:23 220' still dry when sounding and clayey. We pull 30 feet of casing and let sit overnight 16:12 Casing backed off to 190 - N.L. = 138.4 16:50 Crew leaves site 17:35 I leave field office</u>				

FIELD ACTIVITY REPORT

Project Number/WBS: 744139-20010 Date: 7/7/05
 Site: SWMU 58 Arrival Time: 6:30
 Team Leader: Richard Jurik Departure Time \ Destination: 17:10
 Team Members: Matt Ivers, Kurt Allaway Weather: clear 70-95° no wind

Purpose: (Attach all appropriate forms)

- ☐ Geophysical Survey
☐ Soil Gas Survey
☐ Hydropunch
☐ Test Pit
☐ GPS
☐ CPT
☐ Other (specify) _____

- ☐ Well Installation D-18
☐ Well Development _____
☐ Microwell Sampling
☐ Monitor Well Sampling
☐ Vertical Boring
☐ Angle Boring
☐ Hand Auger
☐ Surface Soil Sampling

Protection Level: ☒ D ☐ C ☐ B ☐ A

Health and Safety Briefing: Time 12:50 People Present Matt Ivers, Tom Kern, Jake Smith

Topics Discussed: Proper PPE in saturated zone

Logbook

Book # B071503
 Page # 144

Photos Camera # _____ Roll # _____ Frame # _____

IDW Drums: Purge / Rinse / Soil Drum Number(s): ES

Closed?: Y / N

Current Location: _____

Update DITF?: Y / N

Notes: 6:30 I arrive at field office 7:05 I arrive at D-18 and
take Water Level = 138.4' bgs. Crew & Carl are in haz waste
training. I go to field office to detach boring log for USACE
9:45 Tom & Jake arrive They go to go day to pump water from soil
Drums while we wait for well construction Decision
12:50 We have H&S taggate & crew goes to sand banchole
from bottom (caved to 212) to 206'. 14:50 I arrive at site & do vis
inspection 15:16 We go to sheep lane with drum truck to meet
M.P. 15:40 MP arrives 16:05 Larry McFarland & Dean Reynolds
arrive 16:15 Kurt onsite for shipment. I go to field office
17:10 I leave site

Attachment 1-2

FIELD ACTIVITY REPORT

Project Number/WBS: <u>744139-20010</u>		Date: <u>7/8/05</u>
Site: <u>SWMU 58</u>		Arrival Time: <u>6:40</u>
Team Leader: <u>Richard Jurik</u>		Departure Time \ Destination: <u>17:45</u>
Team Members: <u>Matt Ivers, Kurt Allaway</u>		Weather: <u>clear 70-100° wind 10 mph to SW</u>

Purpose: (Attach all appropriate forms)	
<input type="checkbox"/> Geophysical Survey <input type="checkbox"/> Soil Gas Survey <input type="checkbox"/> Hydropunch <input type="checkbox"/> Test Pit <input type="checkbox"/> GPS <input type="checkbox"/> CPT <input type="checkbox"/> Other (specify) _____	<input type="checkbox"/> Well Installation <u>D-18</u> <input type="checkbox"/> Well Development _____ <input type="checkbox"/> Microwell Sampling <input type="checkbox"/> Monitor Well Sampling <input type="checkbox"/> Vertical Boring <input type="checkbox"/> Angle Boring <input type="checkbox"/> Hand Auger <input type="checkbox"/> Surface Soil Sampling

Protection Level: ☒ D ☐ C ☐ B ☐ A

Health and Safety Briefing: Time 7:10 People Present Matt Ivers, Tom Kern, Jake Smith

Topics Discussed: Lifting technique during well construction

Logbook	Book # <u>B071503</u> Page # _____
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Photos	Camera # _____	Roll # _____	Frame # _____
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IDW Drums: Purge / Rinse / Soil Drum Number(s): <u>ES</u>		
Closed?: <u>Y / N</u>	Current Location: _____	Update DITF?: <u>Y / N</u>

Notes: 6:40 Arrive at site & take W.L. = 138.4 7:00 Tom & Jake arrive and sound bottom at 212'. Hole cased to 190 7:10 During inspection and have H&S tagline 7:25 Begin sampling 7:55 Samples from 212 to 206 - 7 bags - calculated volume 5.2 bags 8:23 Begin construction - screen 205-180 blank 180-175 screen 175-155 10:45 Well sampled 206 to 179.4 - 23 bags - calculated volume = 18.2 bags 11:06 3 buckets bentonite pellets placed top of pellets 175.7 12:44 Sand placed 175.7 - 151.7 w/ 17 bags calculated volume = 16.6 bags 13:03 2 buckets pellets bring top of seal to 147.6 Let hydrate 14:36 Begin grouting 16:50 Grout to surface - 22 bags calculated volume = 23.5 bags. 17:20 Will do surface completions Monday on D-17 & D-18 17:45 Offsite

Attachment 1-2

FIELD ACTIVITY REPORT

Project Number/WBS: <u>744139-20010</u>		Date: <u>7/11/05</u>	
Site: <u>SWMU 58</u>		Arrival Time: <u>12:20</u>	
Team Leader: <u>Richard Jurik</u>		Departure Time \ Destination: <u>17:20</u>	
Team Members: <u>Math Ivers, Kurt Alloway</u>		Weather: <u>clear 80-90° no wind</u>	

Purpose: (Attach all appropriate forms)		<input checked="" type="checkbox"/> Well Installation <u>D-17 D-18</u>
<input type="checkbox"/> Geophysical Survey		<input type="checkbox"/> Well Development
<input type="checkbox"/> Soil Gas Survey		<input type="checkbox"/> Microwell Sampling
<input type="checkbox"/> Hydropunch		<input type="checkbox"/> Monitor Well Sampling
<input type="checkbox"/> Test Pit		<input type="checkbox"/> Vertical Boring
<input type="checkbox"/> GPS		<input type="checkbox"/> Angle Boring
<input type="checkbox"/> CPT		<input type="checkbox"/> Hand Auger
<input type="checkbox"/> Other (specify) _____		<input type="checkbox"/> Surface Soil Sampling

Protection Level: ☒ D ☐ C ☐ B ☐ A

Health and Safety Briefing: Time _____ People Present Math Ivers, Tom Kern, Jake Smith

Topics Discussed: _____

Logbook	Book # <u>B071503</u>	
	Page # <u>147</u>	

Photos Camera # _____ Roll # _____ Frame # _____

IDW Drums: Purge / Rinse / Soil Drum Number(s): ES

Closed?: Y / N Current Location: _____ Update DITF?: Y / N

Notes: 12:20 Arrive at field office. Tom Kern & Jake Smith outside w/ Kurt Alloway. Crew has set ballands at D-18. Picking up t-posts to protect well from cows. 10:45 Ballands and pad complete at D-18 and ballands surrounded by t-posts and rope. Ballands set at D-17 and t-posts and rope in place 17:17 Offsite

FIELD ACTIVITY REPORT

Project Number/WBS: <u>744139-20010</u>		Date: <u>7/12/05</u>			
Site: <u>SWMU 58</u>		Arrival Time: <u>8:00</u>			
Team Leader: <u>Richard Jurik</u>		Departure Time \ Destination: <u>5:00</u>			
Team Members: <u>Matt Ivers, Kurt Alloway</u>		Weather: <u>clear, hot (80-90) no wind</u>			
Purpose: (Attach all appropriate forms) <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <input type="checkbox"/> Geophysical Survey <input type="checkbox"/> Soil Gas Survey <input type="checkbox"/> Hydropunch <input type="checkbox"/> Test Pit <input type="checkbox"/> GPS <input type="checkbox"/> CPT <input type="checkbox"/> Other (specify) _____ </td> <td style="width: 50%; vertical-align: top;"> <input checked="" type="checkbox"/> Well Installation <u>D-17, D-18</u> <input type="checkbox"/> Well Development _____ <input type="checkbox"/> Microwell Sampling <input type="checkbox"/> Monitor Well Sampling <input type="checkbox"/> Vertical Boring <input type="checkbox"/> Angle Boring <input type="checkbox"/> Hand Auger <input type="checkbox"/> Surface Soil Sampling </td> </tr> </table>				<input type="checkbox"/> Geophysical Survey <input type="checkbox"/> Soil Gas Survey <input type="checkbox"/> Hydropunch <input type="checkbox"/> Test Pit <input type="checkbox"/> GPS <input type="checkbox"/> CPT <input type="checkbox"/> Other (specify) _____	<input checked="" type="checkbox"/> Well Installation <u>D-17, D-18</u> <input type="checkbox"/> Well Development _____ <input type="checkbox"/> Microwell Sampling <input type="checkbox"/> Monitor Well Sampling <input type="checkbox"/> Vertical Boring <input type="checkbox"/> Angle Boring <input type="checkbox"/> Hand Auger <input type="checkbox"/> Surface Soil Sampling
<input type="checkbox"/> Geophysical Survey <input type="checkbox"/> Soil Gas Survey <input type="checkbox"/> Hydropunch <input type="checkbox"/> Test Pit <input type="checkbox"/> GPS <input type="checkbox"/> CPT <input type="checkbox"/> Other (specify) _____	<input checked="" type="checkbox"/> Well Installation <u>D-17, D-18</u> <input type="checkbox"/> Well Development _____ <input type="checkbox"/> Microwell Sampling <input type="checkbox"/> Monitor Well Sampling <input type="checkbox"/> Vertical Boring <input type="checkbox"/> Angle Boring <input type="checkbox"/> Hand Auger <input type="checkbox"/> Surface Soil Sampling				
Protection Level: <input checked="" type="checkbox"/> D <input type="checkbox"/> C <input type="checkbox"/> B <input type="checkbox"/> A					
Health and Safety Briefing: Time <u>—</u> People Present <u>Matt Ivers, Tom Kern, Jake Smith</u>					
Topics Discussed: <u>—</u>					
Logbook		Book # <u>B071503</u>			
		Page # <u>—</u>			
Photos	Camera # _____	Roll # _____	Frame # _____		
IDW Drums: Purge / Rinse / Soil Drum Number(s): ES					
Closed?: Y / N		Current Location: _____			
		Update DITF?: Y / N			
Notes: <u>Crew set protection pad at D-17. Painted guard posts and protection on D-17 and D-18, moved to 90-Day yard, deconvoluted pipe truck, moved equipment back to D-19</u>					

HEALTH AND SAFETY BRIEFING D-18

Date: 7 / 1 / 05

Time: 7:30

Site Health and Safety Officers(s)

ATTENDEES SIGNATURE

1. <u>Walt Lewis</u>	11.
2. <u>Tom K...</u>	12.
3. <u>Jacob Smith</u>	13.
4.	14.
5.	15.
6.	16.
7.	17.
8.	18.
9.	19.
10.	20.

AGENDA

1. To avoid heat stress, drink water often, dress lightly,
2. work in the shade whenever possible,
3. If feeling ill effects from the heat take refuge
4. in the air conditioned vehicle until you recover
- 5.
- 6.
- 7.
- 8.
- 9.

NOTE: Site specific health and safety (tailgate) briefings will be conducted each morning at the work sites by the field team leader. Briefings will be documented in the field log.

HEALTH AND SAFETY BRIEFING D-18

Date: 7 / 6 / 05

Time: 7:20

Site Health and Safety Officers(s)

ATTENDEES SIGNATURE

1. <u>MTA /ms</u>	11.
2. <u>Tom Ka</u>	12.
3. <u>Jacob L. Smith</u>	13.
4.	14.
5.	15.
6.	16.
7.	17.
8.	18.
9.	19.
10.	20.

AGENDA

1. Drum handling is a likely time to pinch
2. hands or smash feet
3. - Never get below drum while moving
4. - Keep hands clear of clamps
5. - Never try to move drums by hand and
6. back
- 7.
- 8.
- 9.

NOTE: Site specific health and safety (tailgate) briefings will be conducted each morning at the work sites by the field team leader. Briefings will be documented in the field log.

HEALTH AND SAFETY BRIEFING D-18

Date: 7 / 7 / 05

Time: 7:00

Site Health and Safety Officers(s)

ATTENDEES SIGNATURE

1. <u>Jacob Smith</u>	11.
2. <u>Tom Hor</u>	12.
3. <u>Walt</u>	13.
4.	14.
5.	15.
6.	16.
7.	17.
8.	18.
9.	19.
10.	20.

AGENDA

1. <u>Handling any generated water should be</u>
2. <u>done wearing nitrile gloves and safety glasses</u>
3. <u>with side shields</u>
4.
5.
6.
7.
8.
9.

NOTE: Site specific health and safety (tailgate) briefings will be conducted each morning at the work sites by the field team leader. Briefings will be documented in the field log.

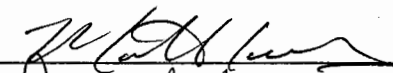
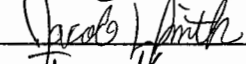
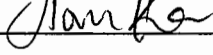
HEALTH AND SAFETY BRIEFING D-18

Date: 7 / 8 / 05

Time: 7:10

Site Health and Safety Officers(s)

ATTENDEES SIGNATURE

1. 	11.
2. 	12.
3. 	13.
4.	14.
5.	15.
6.	16.
7.	17.
8.	18.
9.	19.
10.	20.

AGENDA

1. Much heavy and awkward lifting occurs
2. Dorry well construction. Lift with your knees
3. not your back and keep the weight as close
4. to your body as possible to avoid injury
5. Don't twist while lifting heavy objects
- 6.
- 7.
- 8.
- 9.

NOTE: Site specific health and safety (tailgate) briefings will be conducted each morning at the work sites by the field team leader. Briefings will be documented in the field log.

Layne Christensen Company Job Site Safety Audit

Date 7-6-05

Site: TEAR - Phase II RFI/SWMU 58

Client: PARSONS / USACE

Rig/Crew: AP1000 TOM KERN, JAKE SMITH

D-18

Observers: MATT IVERS

Crew Safety/PPE

	YES	NO	N/A		YES	NO	N/A
Hard Hat	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Safety Glasses	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lifting Belt	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Training Certificates	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Gloves	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Hearing Protection	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Safety Shoes	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proper Clothing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Layne Safety Practice Manual	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Dust masks/Level C respirators	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DOT physical card, CDL and logbooks present and up to date?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Emergency numbers/HASP present and posted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments:

Site Set-up and Safety

Hole openings covered or tied off?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Timbers and set-up jacks stable?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Anchor guy lines secure, evenly tensioned and flagged?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Mud or circulation pits barricaded or fenced?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Excavation permit (CA) and shoring considerations?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Traveling blocks, widow makers and elevators inspected?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Site clean and organized? Footing?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Bulk fuel stores lined and grounded?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pipe blocked and sloped from work area?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Correct monitoring equipment present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Overhead and underground lines identified?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Chemicals stored away from fuel and protected?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Material Safety Data Sheets present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Warning signs/Exclusion zone posted?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Comments:

Rig Safety

Kill switch operational?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	All mast wiring in conduits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vehicle pretrip inspection performed and documented?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Seat belts available and used on all equipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fire extinguisher present and charged?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	First aid/BBP kit present and stocked?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Danger points color coded?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Controls identified?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Side guardrails on platform rigs?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Ropes and chains in good condition?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Belts and rotating shafts guarded?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	All hooks have safety latches?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cables in good shape, clamps installed properly?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Pressure hoses safety chained at connections?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Good housekeeping in vehicle cabs?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Spill control materials present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Rig Safety (cont'd.)			YES	NO	N/A				YES	NO	N/A
DOT #53175 and inspection stickers present and up to date?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Bill of lading, HAZMAT CDL and placarding for hazardous materials hauled?				<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Climbing blocks and body harness installed, available and used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Heaters and engines vented outdoors and extinguished?				<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Comments:											
Tool and Equipment Safety											
Spinning chains have rope tail?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Safety cans used for gasoline storage?				<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Tools and slings in good condition?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	All generators grounded?				<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Compressed gas bottles secure and upright?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	GFI used and electrical cords in good condition?				<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Tag lines used on hoisted pipe and equipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Check valve at torch/hose connection and hoses in good condition?				<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Comments:											
Employee Training											
Employees instructed on safe equipment use?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Heat stress breaks followed and documented?				<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Knowledgeable of chemicals on site?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	First aid/CPR certified?				<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Documented tailgate safety meeting before start of work?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Applicable training up to date including respirator fit test, MSHA and/or OSHA.				<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Comments: H&S tailgate Topics: 7/1/05 Heat Stress 7/6 Drums Handling 7/7 Saturated Zone PPE 7/8 Lifting Safety											
Confined Space Work											
Confined Space Entry Permit complete?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Gas monitor on site?				<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Ventilation equipment available?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Body harness and safety line present?				<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Pump Jobs/Well Rehabilitation/Filters and Vaults											
Lockout/Tagout on electrical controls?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Chemical storage area secure?				<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
PPE for chemicals available?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Water available for flushing chemicals?				<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Cable spool and in safe position?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Explosives stored and secured properly?				<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Test pump engine drive shaft guarded?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	.							
Comments: For the week we rechecked on 7/7 Matt Lunn 7/8 Matt Lunn											
Auditor's Signature <u>Matt Lunn</u>											
Driller's Signature <u>Tom Lunn</u>											
Helper's Signature <u>Jacob Smith</u>											

EQUIPMENT CALIBRATION LOG

Tooele Army Depot
Phase II RFI @ SWMU 58

Eqpt. Type PID	Serial No.	Date	Calibration Time	Calibration Gas	Calibration Gas Lot No.	Calibrated By:	Comments
MWIRAE2000	9296	6/29/05	9:25	100 ppm isobutylene	82617-117	Math Ivers	Monitoring well D-17
"	"	7/6/05	7:50	"	"	"	" D-18
"	"	7/14/05	8:10	"	"	"	" D-19
"	"	7/20/05	14:40	"	"	"	" C-45
"	"	7/28/05	10:40	"	"	"	" C-48f
"	"	7/29/05	7:30	"	"	"	" "
"	"	8/1/05	8:30	"	"	"	" "
"	"	8/5/05	8:05	"	"	"	" C-47f
"	"	8/8/05	8:25	"	"	"	" "
"	"	8/9/05	8:38	"	"	"	" "
"	"	9/20/05	8:50	"	"	"	" C-49

Attachment 7-1





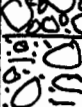
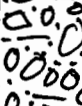

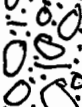





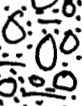



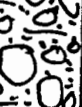









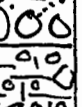
APPENDIX C

DRILLING LOG		DIVISION		INSTALLATION		SHEET	
Sacramento		Tobele Army Depot		OF 6 SHEETS			
1. PROJECT Phase II RFI @ SWMU 58				10. SIZE AND TYPE OF BIT 9" OD 6" ID			
2. LOCATION (Coordinates or Station) 7380823.93N 1404691.14E				11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL			
3. DRILLING AGENCY Layne Geosconstruction				12. MANUFACTURER'S DESIGNATION OF DRILL Drill Systems AP1000 Becker Hammer			
4. HOLE NO. (As shown on drawing title and file number) D-18				13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		DISTURBED 45	
5. NAME OF DRILLER Tom Kervu, Jake Smith				14. TOTAL NUMBER CORE BOXES		UNDISTURBED 0	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.				15. ELEVATION GROUND WATER 141.66 TOC 7/18/05			
7. THICKNESS OF OVERBURDEN 220'				16. DATE HOLE STARTED 7/1/05 COMPLETED 7/6/05			
8. DEPTH DRILLED INTO ROCK 0				17. ELEVATION TOP OF HOSE CASING 4476.07			
9. TOTAL DEPTH OF HOLE 220'				18. TOTAL CORE RECOVERY FOR BORING ground 4473.20			
				19. SIGNATURE OF INSPECTOR W. J. J. J.			










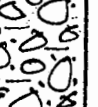


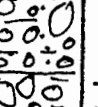

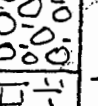
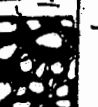

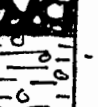
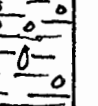

TIME	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	RECOVERY	SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
8:06	2		Lean Clay (CL), high plasticity Light olive brown 2.5Y 5/4 moist, weak reaction to HCL			Because the Becker Hammer Drilling Method allows a maximum clast size of about 6 inches to get to the surface, percentages of boulders, cobbles and gravel are speculative
8:11	4				1	
8:13	6					
	8					
	10				2	0.5 mm/ft
	12					While clasts range from angular to rounded, many angular clast are likely created by the drilling process so as long as some water worn clasts are observe in samples, bedrock will not be indicated
	14				3	
	16					0.5 mm/ft
8:18	18		silt (ML) low plasticity yellowish brown 10YR 5/4 moist, weak reaction to HCL		4	Unless otherwise indicated, rock type represented in the cuttings consists of primarily varying percentages of tan to gray quartzite and gray to dark gray limestone and dolomite, with trace amounts of yellow brown sandstone Multicolored volcanics and a white silicate mineral
8:20	20					
	22				5	
	24		Silty Sand (SM), non plastic brown 10YR 5/3			
	26					
	28					
8:24	30		Silty Sand with Gravel (SM)			0.4 mm/ft

TIME	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	RECOVERY	SAMPLE NO.	REMARKS
28			Silty Sand w/gravel (SM)	X	6	
	32		80% sand, fine grain			
	34		20% gravel, fine to coarse, angular to subrounded, non plastic			
	36		yellowish brown 10YR5/4	X	7	
	38		Moist, weak reaction to HCL			
8:31						
8:34	40			X	8	0.3 min/ft
	42					
	44		Silty Clay w/gravel (CL)			
	46		60% clay, 40% gravel moderate plasticity, fine to coarse gravel, angular to subround, brown 7.5 YR5/3, moist, weak HCL	X	9	
	48		Well graded gravel w/sand (GW) 70% gravel f to c, a to sv 20% sand med to coarse, 10% fine brown 7.5 YR5/3, moist weak HCL	X	10	
8:44						
8:47	50			X	11	1.0 min/ft
	52		boulders; cobbles with clay (GC)			
	54					
	56		Well graded gravel w/sand (GW) 80% cobble and gravel coarse grained, angular to subround 15% sand med to coarse, 5% fines brown 7.5 YR 4/3, moist strong HCL reaction	X	12	
	58					
9:00	60			X	13	1.3 min/ft
9:11	62					
	64					
	66		- slight clay increase	X	14	
	68					
9:21	70					1.0 min/ft

TIME	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	RECOVERY	SAMPLE NO.	REMARKS
9:25	72		Well graded gravel with sand (GW) 80% cobble and gravel, fine to coarse angular to subrounded 20% sand, brown 7.5YR 5/2, moist, strong reaction to HCL	X	15	
	74					
	76			X	16	
9:35	78					
9:38						- Drive Spool Plugs up
9:40	80					1.2 min/ft
9:43				X	17	
	82					
	84					
	86			X	18	
	88					
9:54	90			X	19	1.1 min/ft
9:58						
	92					
	94					
	96			X	20	
	98					
10:10	100			X	21	1.2 min/ft
7/6/05				PID = 0.3		
801	102					
	104		slight increase in clay content			
	106			X	22	
				0.1		
	108					
	110					
8:21						2.0 min/ft
						Drum 01 full

TIME	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	RECOVERY	SAMPLE NO.	REMARKS
7:16/05 8:29	112		Well Graded Gravel with sand (GW) 80% cobble & gravel, 20% sand angular to subangular fine to coarse, brown 7.5YR 5/2, moist, weak reaction to HCL	 0.0 (PID)	23	
	114				24	Drum full 02-
	116			0.4		
	118		Well-graded gravel with clay (GW) 70% cobble and gravel, 20% sand, a to sr, f to c, brown 7.5YR 5/4, moist, weak reaction to HCL		25	1.3 min/ft
8:42 9:01	120			0.1		
	122				26	
	124			0.0		
	126				27	1.8 min/ft
9:19 9:31	130			0.0		Drum 03 full
	132				28	Eventual Static W.L. = 138.4 ft BGS 
	134			0.2		
	136				29	1.4 min/ft
9:45 9:49	140			0.5		
	142				30	- change drums 04 full
9:53 9:59	144			0.0		
	146					
	148					
10:07	150		- Silty Clay w/gravel 40% cobble + gravel a to sr, mostly coarse (see next)			1.2 min/ft

TIME	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	RECOVERY	SAMPLE NO.	REMARKS
10:10	152		Silty Clay w/cobble + gravel (CL), 40% cobble; gravel, angular to subround, mostly coarse, weak plasticity light olive brown 2.5 PR 5/3, moist, weak reaction to HCL	0.3 (PID)	31	
	154					
	156				32	
	158		well graded gravel with sand (GW) 60% cobble + gravel 40% sand	0.0		
10:22	160		angular to subround fine to coarse brown 7.5 PR 5/2 moist, strong reaction to HCL			1.2 min/ft
10:29	162			0.2	33	Drum off full
	164					
	166		Well graded gravel with clay (GW) as at 115'	0.0	34	
	168					
10:44	170		Clayey Gravel w/sand (GC) 40% cobble + gravel 40% silty clay 20% sand, moderate plasticity, pale brown 10 PR 6/3, Dry to moist weak reaction to HCL	0.0	35	1.5 min/ft
10:58	172					
	174					
	176				36	Drum off full
11:10	178			0.3		fuel line breaks
11:49	180		- gravel decreases to 20% clay increases to 60-70% sand 10%		37	1.5 min/ft
11:52	182			0.2		
11:57	184		Silty Gravel (GM) 60% cobble + gravel 40% silty, non cohesive pale brown 10 PR 6/3 wet, no reaction to HCL		38	first saturated cuttings observed 184'
	186			0.0		Drum off full
	188		Well Graded Gravel w/sand (GW) 60% gravel, 40% sand brown 7.5 PR 5/2, moist strong reaction to HCL			
12:19	190					

TIME	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	RECOVERY	SAMPLE NO.	REMARKS
12:45	192		- Well Graded gravel w/sand as above (GW)		39	- Some production of water 192-195
12:57	194		- strongly cemented (195-198)	0.7 (PID)		
13:58	196				40	- head overhauling
	198			0.2		
14:12	200				41	2.0 min/ft
14:20	202			0.0		- free water (201-204)
14:28	204		- Well graded gravel w/clay (GW), 70% gravel 20% sand 10% clay, weak cohesion brown F.S. R 5/2, moist to wet		42	- change Draw 08 to 09 full
14:33	206			0.0		
14:45	210				43	1.6 min/ft
14:55	212		- silty clay (CL)	0.0		
15:10	214		- weakly cemented (214-216) Gravel		44	- change Draw 09 to 10 full
15:16	216		- silty clay w/gravel (CL) 80% clay 20% fine gravel, brown F.S. R 5/2 Moist, weak reaction to HCL	0.0		
15:23	220				45	2.2 min/ft
				0.0		Draw 10 partially full



Integrated Subsurface Evaluation

311 Rock Avenue • Golden, CO 80401
PH 303.526.4432 • FAX 303.526.4426

email: PedlerRAS@aol.com • www.rasinc.org

D-18

COMPANY : Parsons
WELL : D-18
LOCATION/FIELD : None
COUNTY : None
STATE : UT
SECTION : None

OTHER SERVICES:

None
None
None

TOWNSHIP : None RANGE : None

DATE : 09/10/05
DEPTH DRILLER : 212
LOG BOTTOM : 204.00
LOG TOP : 0.60

PERMANENT DATUM : TOPVC

LOG MEASURED FROM: None

DRL MEASURED FROM: None

KB : None

DF : None

GL : 4473.20

CASING DIAMETER :
CASING TYPE : PVC
CASING THICKNESS: 0

LOGGING UNIT : 202

FIELD OFFICE :

RECORDED BY : DM

BIT SIZE : 6
MAGNETIC DECL. : 0
MATRIX DENSITY : 2.71
NEUTRON MATRIX : Dolomite

BOREHOLE FLUID : 0

RM : 0

RM TEMPERATURE : 0

MATRIX DELTA T : 54

FILE : ORIGINAL

TYPE : 9512A

THRESH: 2500

7380823.93N

1404691.14E

ALL SERVICES PROVIDED SUBJECT TO STANDARD TERMS AND CONDITIONS



Date: 01/18/2006
Project Number 48743.1B

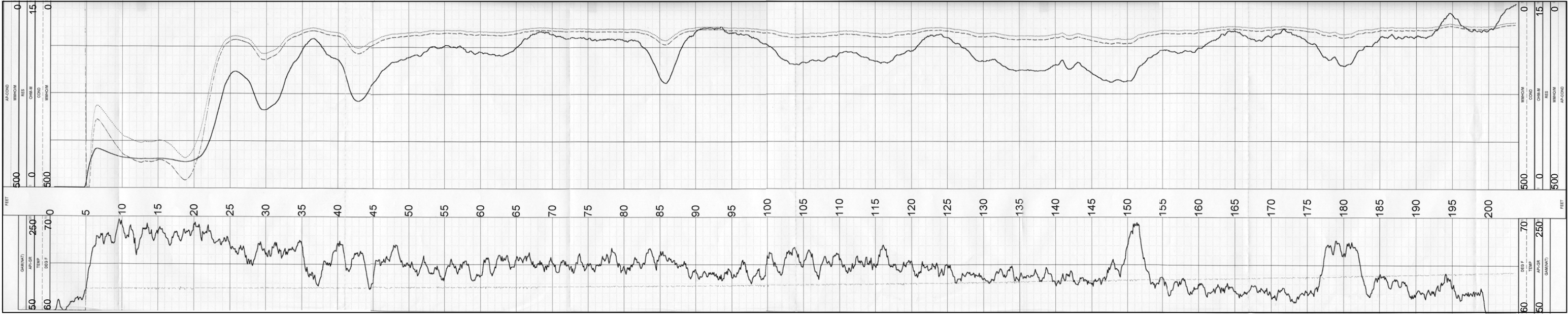
TEAD Phase II RFI

**WELL D-18
NATURAL GAMMA AND
INDUCTION ELECTRICAL LOGS**

SLC6Q017.ppt

PLATE

C-2a





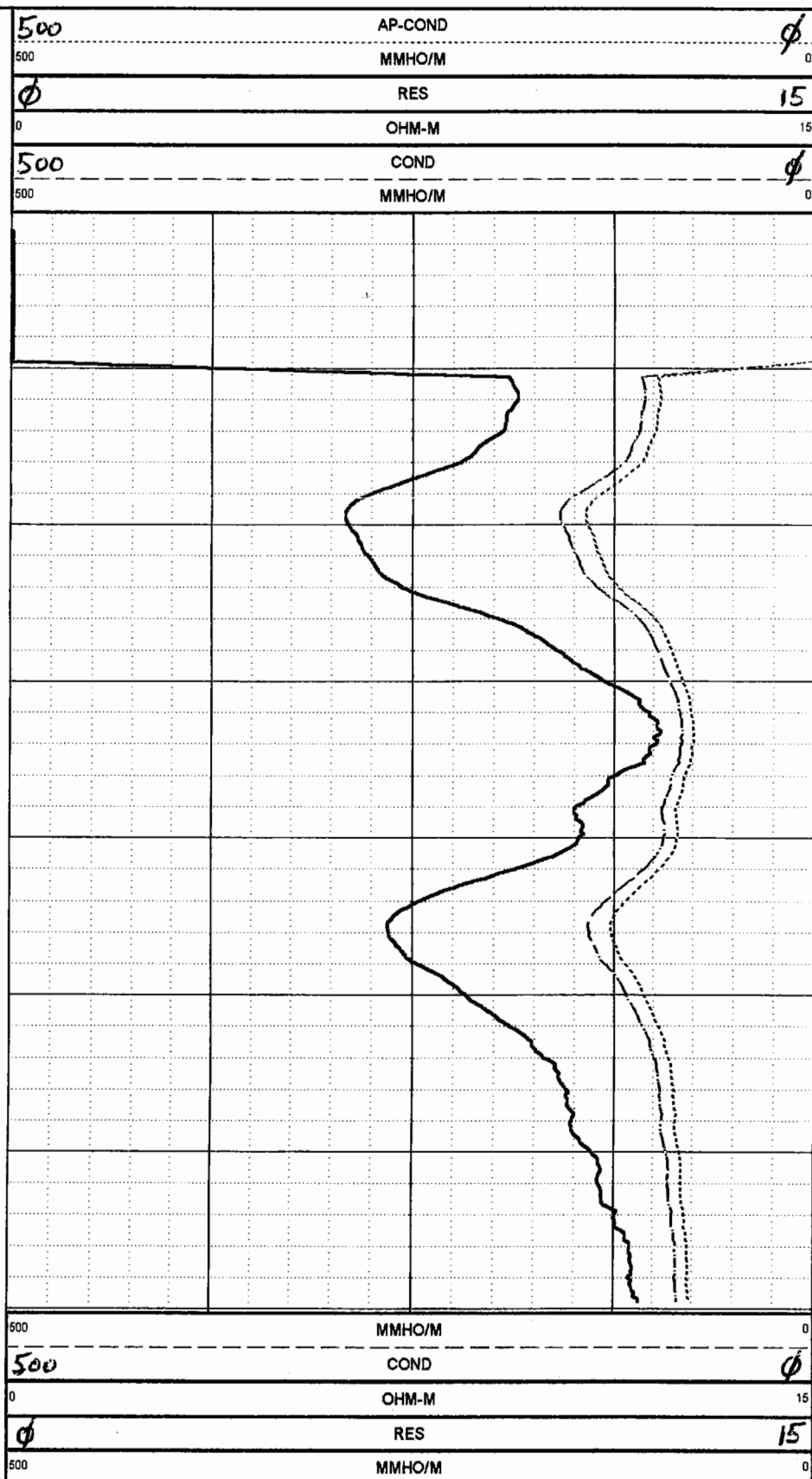
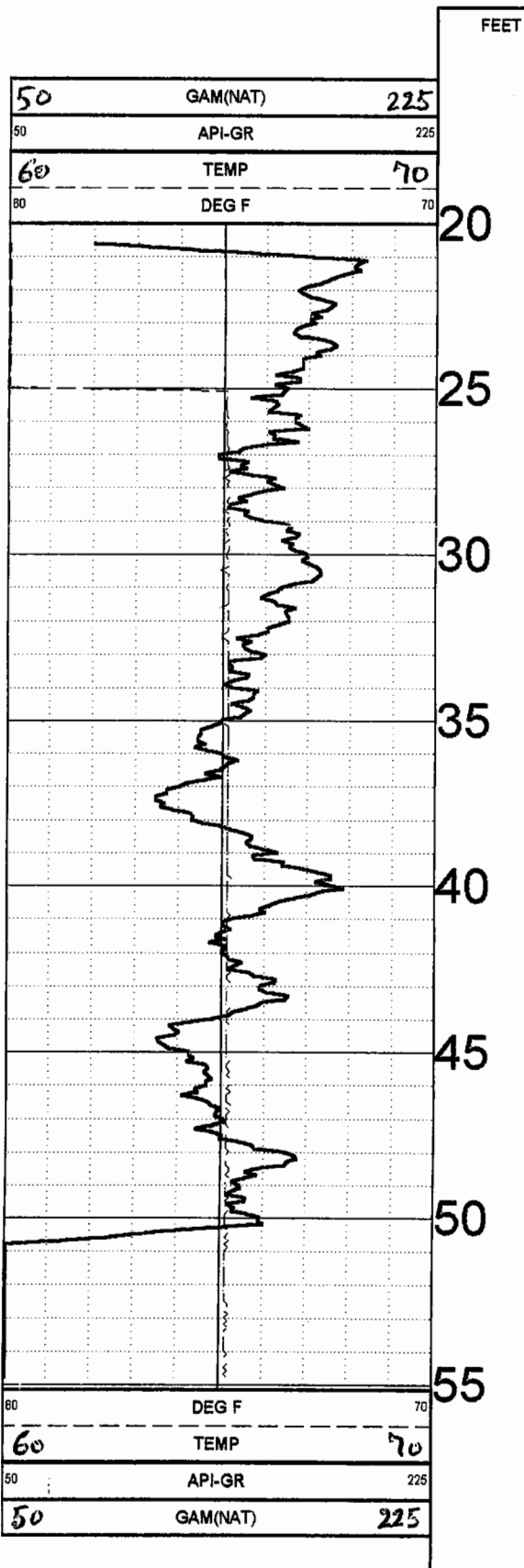
Integrated Subsurface Evaluation

311 Rock Avenue • Golden, CO 80401

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email: PedlerRAS@aol.com • www.rasinc.org

*D-18
Repeat*



④

SERIAL NUMBER 1013

	DATE	TIME	SENSOR	STANDARD	RESPONSE
1	Feb02.05	16:40:28	GAM(NAT)	21.311 [API-GR]	10.00 [CPS]
	Feb02.05	16:40:28	GAM(NAT)	187.500 [API-GR]	127.00 [CPS]
2	Aug16.05	20:30:22	AP-COND	0.000 [MMHO/M]	55467.00 [CPS]
	Aug16.05	20:30:22	AP-COND	705.000 [MMHO/M]	110724.00 [CPS]
3	Aug16.05	19:32:03	TEMP	33.500 [DEG F]	26878.00 [CPS]
	Aug16.05	19:32:03	TEMP	134.400 [DEG F]	32180.00 [CPS]
4	Dec21.99	17:30:50	A	0.414 []	
5	Dec21.99	17:30:50	B	Default []	



Integrated Subsurface Evaluation

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email: PedlerRAS@aol.com • www.rasinc.org

D-18 ✓

COMPANY : Parsons
WELL : D-18
LOCATION/FIELD : None
COUNTY : None
STATE : UT
SECTION : None

OTHER SERVICES:

None
None
None

TOWNSHIP : None RANGE : None

DATE : 09/10/05
DEPTH DRILLER : 212
LOG BOTTOM : 204.00
LOG TOP : 0.60

PERMANENT DATUM : TOPVC

LOG MEASURED FROM: None
DRL MEASURED FROM: None

KB : None
DF : None
GL : 4473.20

SINGLE DIAMETER :
SINGLE TYPE : PVC
SINGLE THICKNESS: 0

LOGGING UNIT : 202
FIELD OFFICE :
RECORDED BY : DM

LOG SIZE : 6
MAGNETIC DECL. : 0
MATRIX DENSITY : 2.71
NEUTRON MATRIX : Dolomite

BOREHOLE FLUID : 0
RM : 0
RM TEMPERATURE : 0
MATRIX DELTA T : 54

FILE : ORIGINAL
TYPE : 9512A

THRESH: 2500

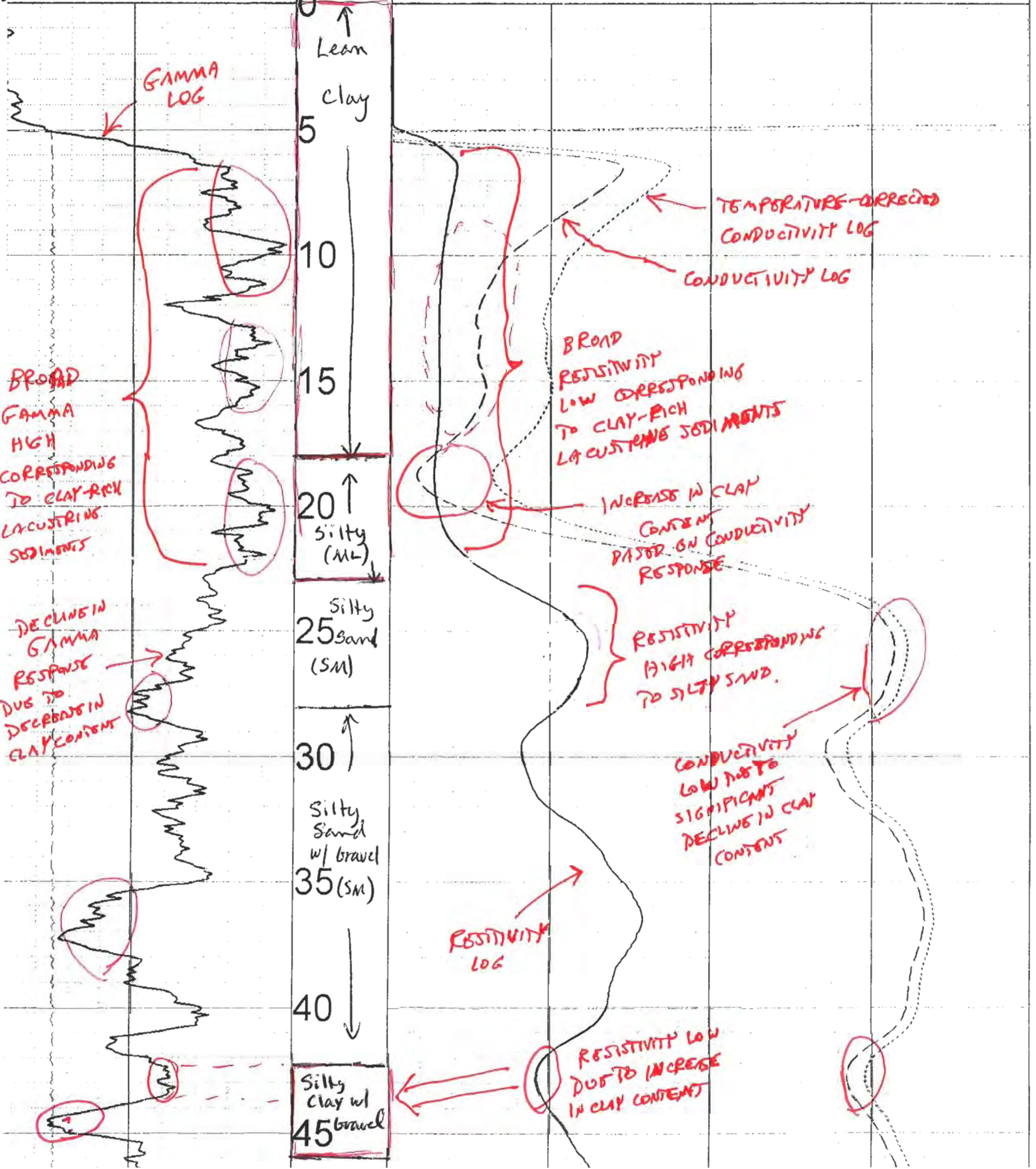
7380823.93N
1404691.14E

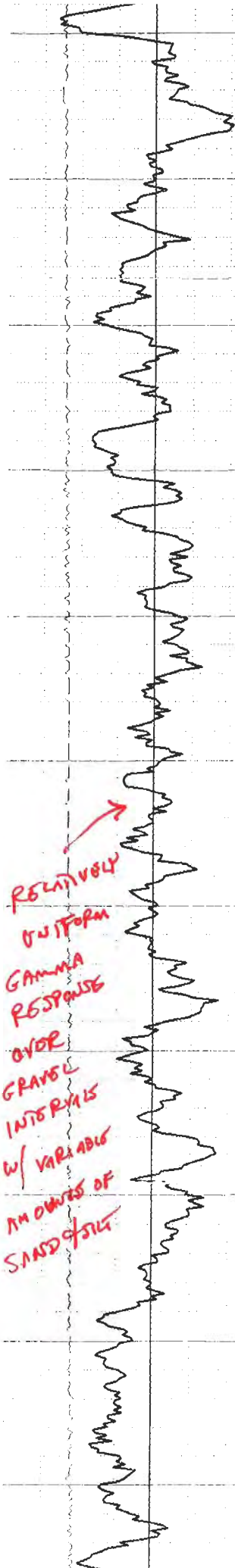
ALL SERVICES PROVIDED SUBJECT TO STANDARD TERMS AND CONDITIONS

INTERPRETATION OF DOWNHOLE GEOPHYSICAL LOGS

BOREHOLE GEOLOGY FROM GEOLOGIC BORING LOG BY MATT IVERS

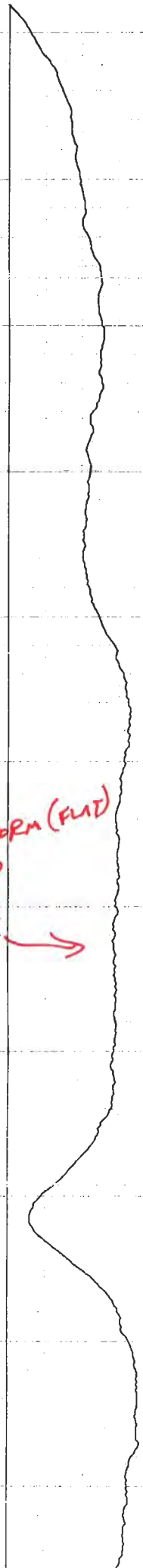
50	GAM(NAT)	225	500	AP-COND	φ
	API-GR	225	500	MMHO/M	
	TEMP			RES	30
60	DEG F	70	500	OHM-M	30
				COND	φ
				MMHO/M	0



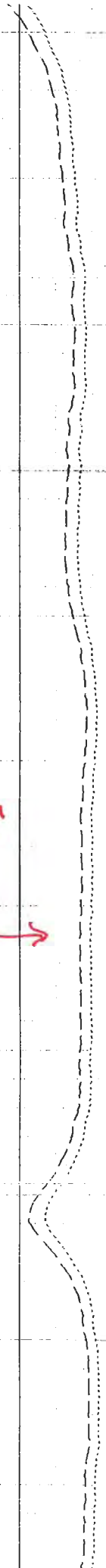


RELATIVELY
UNIFORM
GAMMA
RESPONSE
OVER
GRAVEL
INTERVALS
W/ VARIABLE
AMOUNTS OF
SAND/SILT

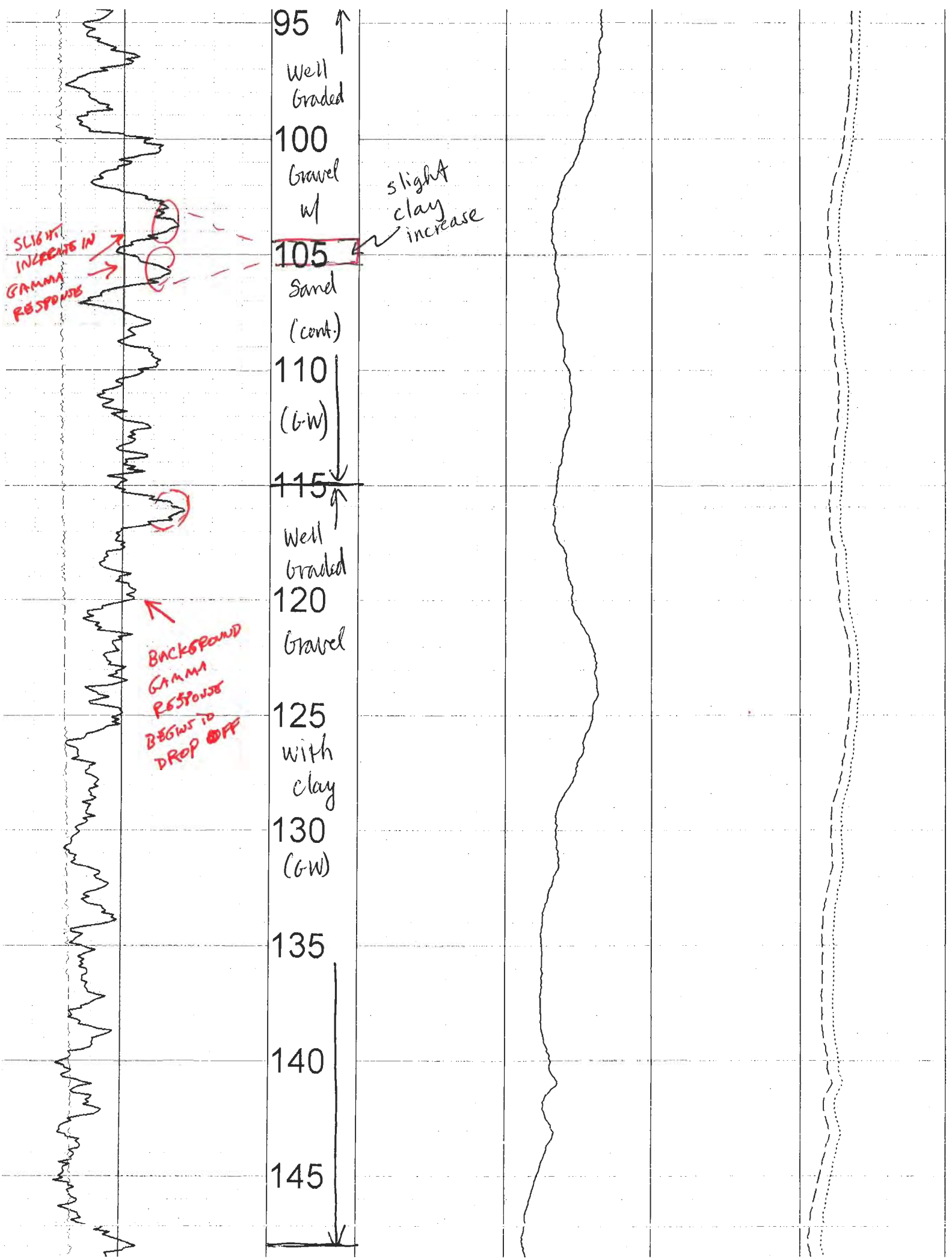
45 (GW)[↑]
well-graded
gravel
w/ sand
50 (GW)
Boulders &
cobbles w/
clay (GW)
55
60
Well
65
graded
70
gravel
(GW)
75
with
80
Sand
85
90
95



VERY UNIFORM (FLUID)
RESISTIVITY
RESPONSE



VERY UNIFORM
CONDUCTIVITY
RESPONSE



95

Well
Graded

100

Gravel
w/

slight
clay
increase

105

Sand
(cont.)

110

(G-W)

115

Well
graded

120

Gravel

125

with
clay

130

(G-W)

135

140

145

SLIGHT
INCREASE IN
GAMMA
RESPONSE

BACKGROUND
GAMMA
RESPONSE
BEGINS TO
DROP OFF

145↑

(b.w)

150 (a)

Silty
clay
w/ Gravel

155

well
graded
gravel

160 w/

Sand
(b.w)

well-graded

165

gravel w/
clay (b.w)

170↑

~~clayey~~
clayey
gravel

175

w/
Sand
(b.c)

180↓

Silty
185
Gravel
(b.w)

Well

190

graded
gravel
w/ Sand

195

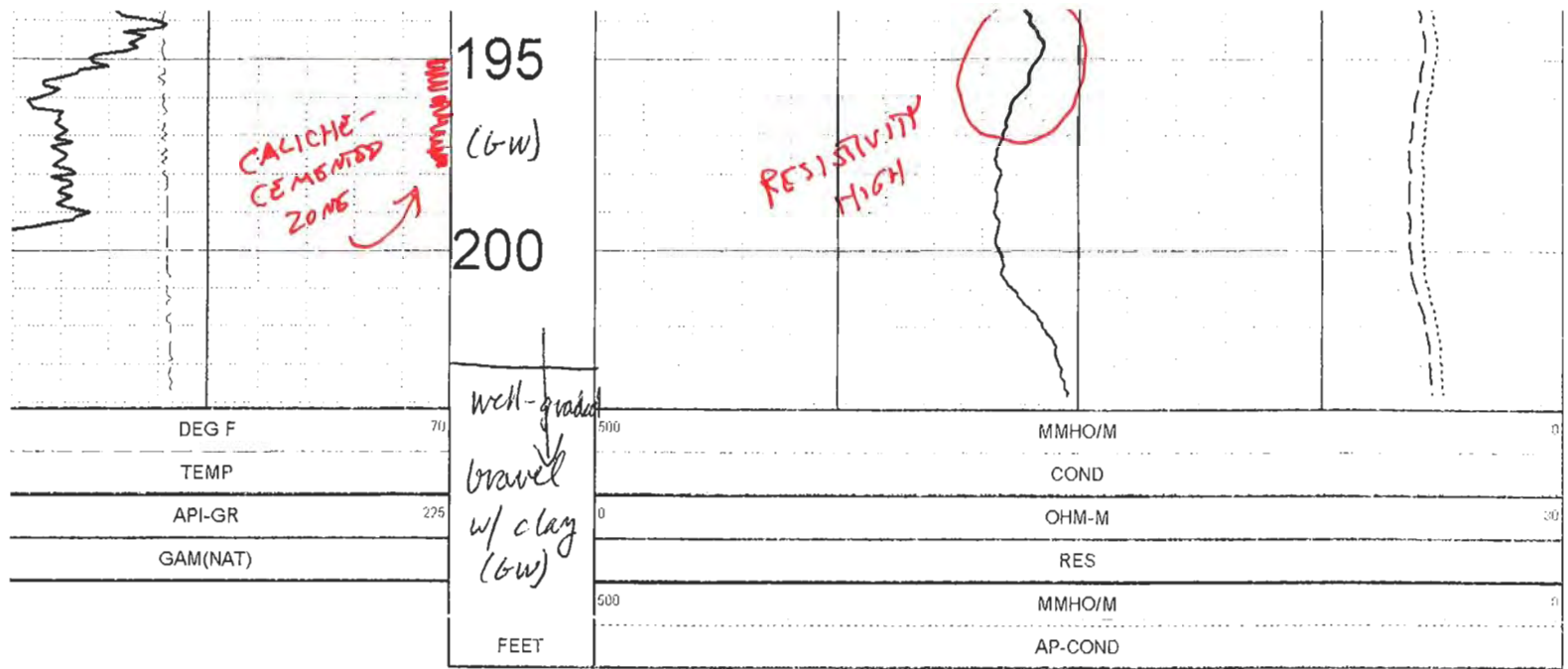
(b.w)

NOTE THE ABSENCE
OF A PRONOUNCED
INDUCED ELECTRIC RESPONSE
FOR THE CLAY-RICH ZONE
@ 149-153 FT

clay increase
to 20%

RESISTIVITY HIGH

STRONGLY
GRADED
CLAY-RICH
ZONE

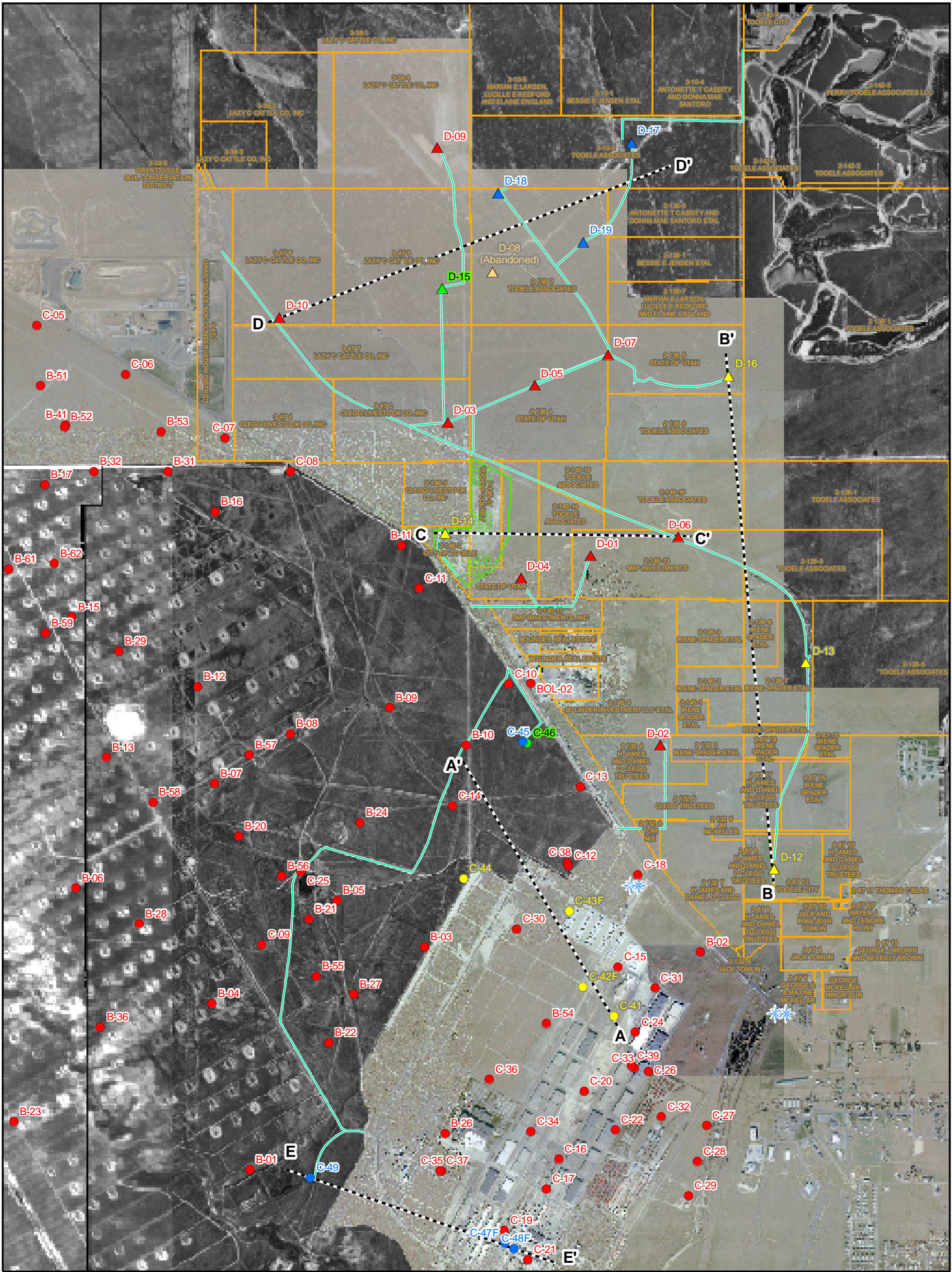


TOOL CALIBRATION D-18 09/10/05 15:40

TOOL 9512A

SERIAL NUMBER 1013

DATE	TIME	SENSOR	STANDARD	RESPONSE
Feb02,05	16:40:28	GAM(NAT)	21.311 [API-GR]	10.00 [CPS]
Feb02,05	16:40:28	GAM(NAT)	187.500 [API-GR]	127.00 [CPS]
Aug16,05	20:30:22	AP-COND	0.000 [MMHO/M]	55467.00 [CPS]
Aug16,05	20:30:22	AP-COND	705.000 [MMHO/M]	110724.00 [CPS]
Aug16,05	19:32:03	TEMP	33.500 [DEG F]	26878.00 [CPS]
Aug16,05	19:32:03	TEMP	134.400 [DEG F]	32180.00 [CPS]
Dec21,99	17:30:50	A	0.414 []	
Dec21,99	17:30:50	B	Default []	



Offsite Groundwater Monitoring Wells

- ▲ Phase I RFI Well
- ▲ Phase I RFI Well - Abandoned
- ▲ Phase II RFI - Installed Fall-Winter 2004
- ▲ Phase III RFI - Installed Summer 2005
- ▲ Proposed Phase II RFI Well

TEAD/UID Groundwater Monitoring Wells

- Existing Well
- Phase II RFI Well - Installed Fall-Winter 2004
- Phase II RFI Well - Installed Summer-Fall 2005
- Proposed Phase II RFI Well

LEGEND

- ★ Survey Benchmark
- Approximate Phase II RFI Well Access Route
- Cross Section Line
- ▨ Former Landfill
- ▭ Parcel Boundaries / Owners

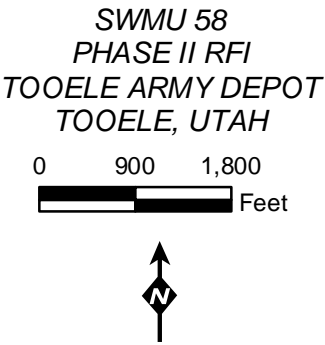
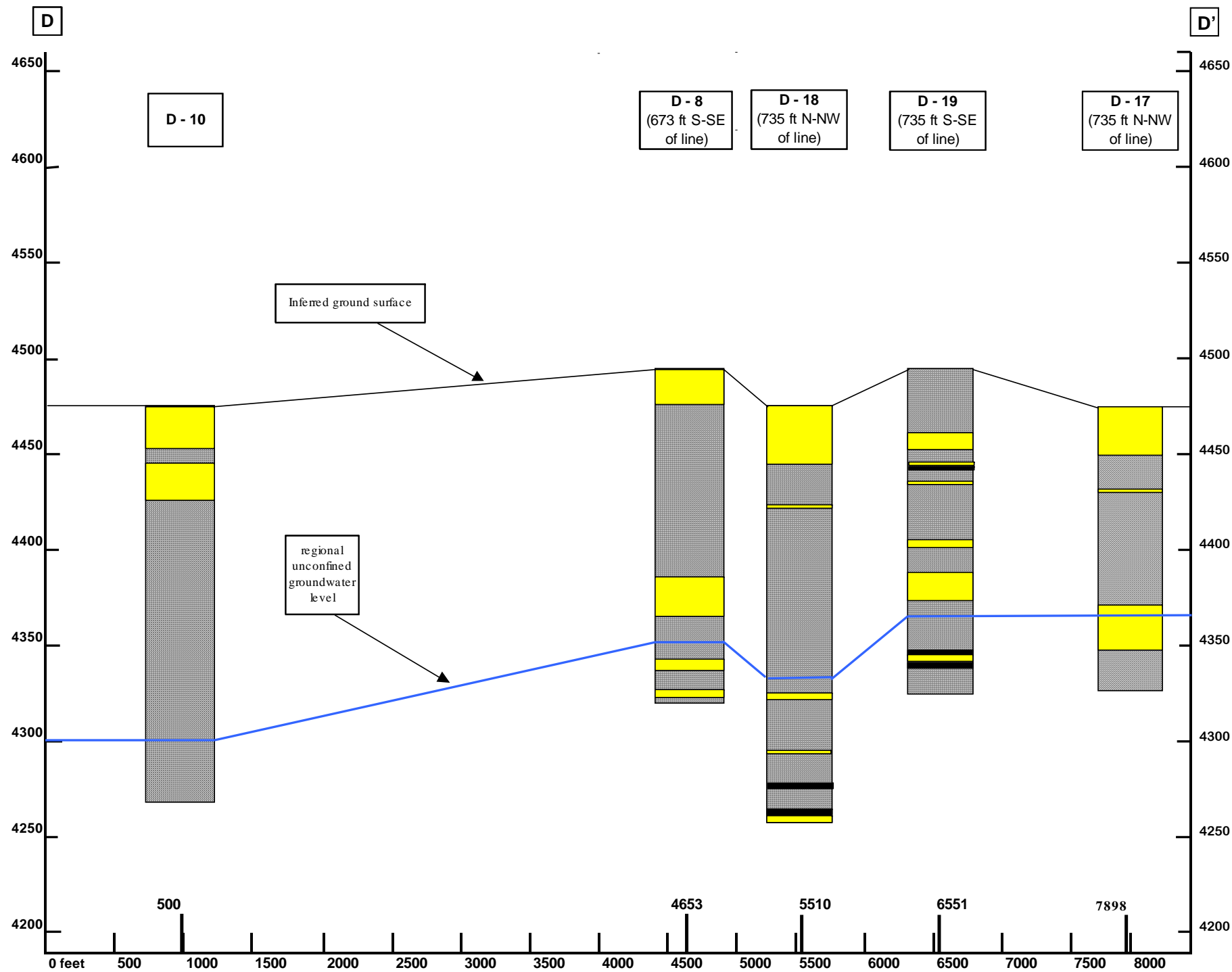


PLATE C-3
CROSS SECTION
LOCATION
DIAGRAM

ELEVATION
(feet m.s.l.)



VERTICAL EXAGGERATION 6.6 X

GROUNDWATER ELEVATIONS FOR D-10, D-17, D-18, D-19 TAKEN SEPTEMBER, 2005

D-8 TAKEN SEPTEMBER, 2002

coarse grained sediments	Poorly graded sand and gravels (SP & GP) Silty sand and gravels (GM & SM)
--------------------------	--

fine grained sediment	Clayey sands and gravels (SC & GC) Lean clay with sand or gravel (CL) Fat clays (CH) and silts (ML)
-----------------------	---

cemented sediments	Chemically precipitated carbonate cementation of the sediment interstices
--------------------	---

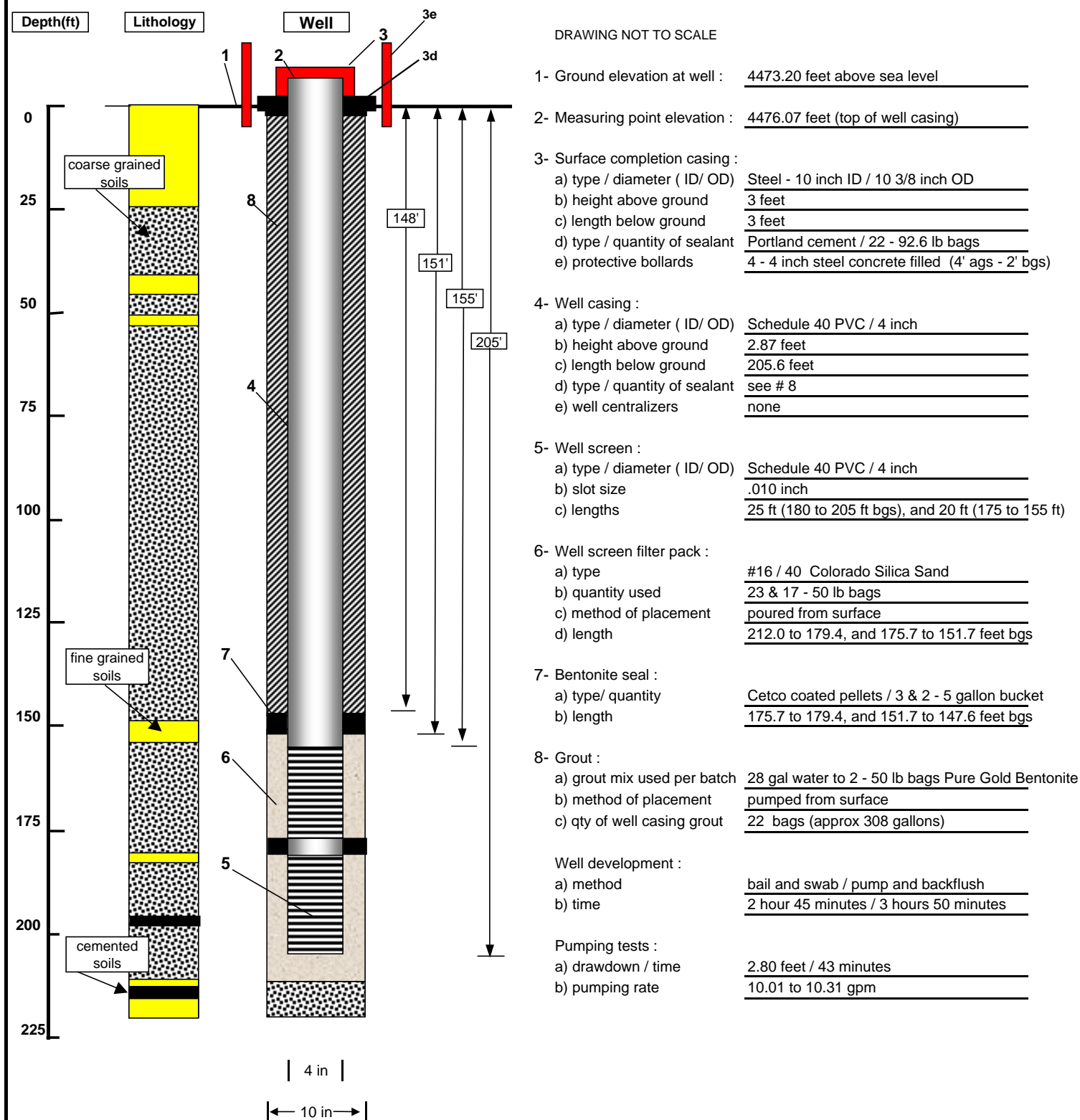
APPENDIX D

CONTRACTOR Kleinfelder/Parsons	WELL NUMBER D - 18	FIGURE D-1
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TEAD Phase II RFI - SWMU 58

MONITORING WELL INSTALLATION DATA RECORD

PROJECT : Phase II RFI - SWMU 58	LOCATION : Tooele County, Utah
DRILLING SUBCONTRACTOR : Layne Geoconstruction	DRILLER: Tom Kearns
DRILLING METHOD AND EQUIPMENT: Becker Hammer-Drill Systems AP1000	HELPERS: Jake Smith
WATER LEVEL : 141.66 ft (TOC) on 7/18/05	START: 7/1/05 END: 7/6/05 GEOLOGIST: Matt Ivers



3. PROJECT: TEAD Phase II RFI @ SWMU 58
4. PROJECT NUMBER: 740277; Contract No. GS-10F-0179J
5. APPLICABLE DOCUMENT: Final Phase II RFI SWMU 58 Work Plan (Parsons, Dec. 2003)
6. DESCRIPTION OF CHANGE: This variance describes the deviation from the monitoring well construction specifications (as outlined in SOP P11) for well D-18. Instead of the standard 20-foot long well screen installed 20 to 40 ft below the groundwater table, two screen intervals will be set: one from 180 to 205 ft and another from 155 to 175 ft bgs. A five-ft blank will separate the two screens, and a bentonite pellet seal will be installed adjacent to the blank. The 16-40 sand comprising the filter pack for the adjacent well screens will extend about one-half foot past the well screens.
7. REASON FOR CHANGE: The monitoring well installation procedures outlined in SOP P11 are predicated on the presence of an unconfined groundwater system. Observations during drilling of D-18 suggest that a confined groundwater system may have been encountered, characterized by significant hydraulic head, although no obvious confining unit has been identified during geologic logging. It has been standard practice at TEAD for the Phase I and II RFIs to install a 20-ft section of well screen from 20 to 40 ft below the groundwater table, and to subsequently sample from that interval. This approach has been developed based on the assumption that regional valley fill aquifer is unconfined in the vicinity of TEAD, and also assumes that the regional unconfined aquifer will continue to drop over time. However, this protocol is not necessarily prudent or relevant at locations such as at D-18, where confined groundwater appears to occur, but yet the nature of the groundwater flow is poorly understood. There the installation of a 20 ft screen over the interval routinely screened would likely result in a dry well since the water producing zone(s) appear(s) to be considerably deeper. Moreover, a single 20-ft section of screen does not allow for adequate characterization of any vertical stratification of dissolved VOCs between the potentiometric surface and water-bearing zones, if measurable confining pressure is present. This aspect is of critical concern, since monitoring well D-18 was installed to serve as a sentinel well near the leading edge of the Northeast Boundary Plume. If significant vertical stratification of VOCs exists there must be confidence that the well has been designed to detect such concentration variations as a function of depth. Finally, the constraint imposed by the standard 20-ft screen length makes a colloidal borescope analysis of this well of limited value to quantify groundwater flow, particularly when considerable uncertainty remains why groundwater was not encountered higher in the borehole. The greater screen length installed in this well should facilitate the identification of any water-bearing intervals that were missed during drilling, and hopefully aid in a better understanding of flow regime at this location. The five foot blank and bentonite pellet seal installed between the two screened intervals in D-18 (i.e., 175 to 180 ft bgs) are designed to provide some isolation of the upper screened interval from the lower, in the event that the lower zone is of lower water quality due to higher TDS. However, it is acknowledged that there will be mixing between the two zones, assuming that water-bearing strata occur within the upper screened interval.
8. RECOMMENDED DISPOSITION: Approve as a formality for the record . The USACE and UDEQ have already agreed to these modifications regarding well construction in a conference call on July 7, 2006, and the well was completed prior to the preparation of this document.
9. PRESENT & COMPLETED WORK IMPACT: Some increase in cost in materials to construct the well. Well may take longer to develop owing to the increase in the total length of well screen and the presence of clay. This may result in the generation of a greater amount of development water, which could lead to higher IRW costs.

SUMMARY OF WELL SURVEY DATA
TEAD Phase II RFI Groundwater Monitoring Wells

-----Elevations (ft above MSL)-----											
Well No.	Measuring Point	Brass Cap	Ground Surface	Top of Well Screen	Bottom of Well Screen	Coordinates for Measuring Point		Section	Range	Township	PVC Riser Stickup
						Northing	Easting				
C-41	4804.70	4802.32	4801.67	4445.68	4425.68	7364933.324	1406930.413	30	R 4 W	T 3 S	3.03
C-42F	4785.09	4785.52	4785.27	4445.27	4425.27	7365504.752	1406335.618	19	R 4 W	T 3 S	-0.18
C-43F	4754.87	4755.23	4755.21	4436.21	4416.21	7366968.52	1406061.58	19	R 4 W	T 3 S	-0.34
C-44	4722.81	4720.44	4719.82	4439.82	4419.82	7367591.88	1404021.61	24	R 5 W	T 3 S	2.99
C-45	4689.99	4687.78	4687.20	4438.20	4418.20	7370229.15	1405164.18	19	R 4 W	T 3 S	2.79
C-47F	4824.53	4825.08	4825.03	4476.08	4446.08	7360556.94	1404815.63	30	R 4 W	T 3 S	-0.50
C-48F	4823.67	4824.08	4824.03	4475.08	4445.08	7360431.77	1404989.18	30	R 4 W	T 3 S	-0.36
C-49	4710.02	4707.49	4706.90	4447.49	4427.49	7361802.01	1401065.35	25	R 5 W	T 3 S	3.12
D-12	4803.05	4800.56	4800.25	4455.25	4435.25	7367777.995	1410018.176	20	R 4 W	T 3 S	2.80
D-13	4720.05	4717.40	4717.32	4355.32	4335.32	7371760.079	1410629.706	17	R 4 W	T 3 S	2.73
D-14	4592.80	4590.93	4590.39	4335.39	4315.39	7374264.49	1403669.88	13	R 5 W	T 3 S	2.41
D-16	4580.11	4577.75	4577.20	4346.20	4326.20	7377300.289	1409139.940	7	R 4 W	T 3 S	2.91
D-17	4476.25	4473.81	4473.24	4343.24	4323.24	7381795.49	1407265.97	6	R 4 W	T 3 S	3.01
D-18	4476.07	4473.89	4473.20	4318.20	4298.20	7380823.93	1404691.14	7	R 4 W	T 3 S	2.87
				4293.20	4268.20						
D-19	4497.75	4495.75	4494.99	4346.99	4326.99	7379876.47	1406330.96	7	R 4 W	T 3 S	2.76

MSL: mean sea level
F for selected well identifiers designates flush-mount surface completion.
Coordinates for measuring point are US State plane 1983, Utah Central 4302, NAD 1983 (CONUS), GEO1D96 (continental US)
All survey data generated by Ward Engineering of Salt Lake City, Utah

Note that well D-18 has two screened intervals.

APPENDIX E



**TOOELE ARMY DEPOT
MONITORING WELL SAMPLING DATA**

Well ID: <u>D-18</u>	Initial Depth to Water: <u>141.66'</u>
Sample ID:	Total Depth of Well: <u>208.47'</u>
Duplicate ID:	Well Diameter: <u>4"</u>
Sample Depth:	(a) 1 Casing Volume:
Date: <u>7/18/05</u>	(b) 1 Filter Pack Water Volume:
Sampled By: <u>Development</u>	(a) + (b) x 3 = Minimum Volume to Purge:
Method of Sampling: <u>4" S.S. Bailer</u>	Method of Purging: <u>4" SS Bailer</u>

Time	Intake depth	Rate (gpm)	Cum. vol. (gal)	Temp (°F)	pH (units)	Conductivity (µS/cm)	Turbidity (NTUs)	TDS (g/L)	DO (mg/L)	ORP (mv)	Salinity (ppt)	Color & Sediment
1041	1st	Bailer	* 3	68.7	7.56	1206	>1000					Tan Fine
1105	10th	Bailer	30	70.2	7.50	1184	>1000					Tan Fine sand
1131	20th	Bailer	60	71.6	7.53	1252	>1000					Tan Fine sand
1135	Surging well	w/		surge	block							
1222	30th	Bailer	90	76.5	7.50	1305	>1000					Tan Fine
1241	Surging well	w/surge		block								
1326	40th	Bailer	120	84.4	7.41	1304	>1000					Cloudy non p

pH Calibration (select two)				Conductivity Meter Calibration		Turbidimeter Calibration	
Buffer solution	pH 4.0	pH 7.0	pH 10.0	Solution	990	Standard	5.39
Instrument reading		7.0	10.0	Instrument reading	990	Instrument reading	5.39

Notes: * Bailer holds 3 gal



**TOOELE ARMY DEPOT
MONITORING WELL SAMPLING DATA**

Well ID: D-18	Initial Depth to Water: 141.66'
Sample ID:	Total Depth of Well: 208.47'
Duplicate ID:	Well Diameter: 4"
Sample Depth:	(a) 1 Casing Volume: 44 gal
Date: 7/18/05	(b) 1 Filter Pack Water Volume:
Sampled By: MA	(a) + (b) x 3 = Minimum Volume to Purge: 132 gal
Method of Sampling: Development 4" Submersible	Method of Purging: Development 4" Submersible

Time	Intake depth	Rate (gpm)	Cum. vol. (gal)	Temp (°F)	pH (units)	Conductivity (µS/cm)	Turbidity (NTUs)	TDS (g/L)	DO (mg/L)	ORP (mv)	Salinity (ppt)	Color & Sediment
1443	167'	10.00	0									
1457	167'	10.01	140	64.0	6.84	818	119	.616	7.83	-35.9	.47	cloudy none
1511	167'	10.05	280	63.9	6.85	786	50.4	.593	7.76	-35.3	.45	cloudy none
1525	167'	10.05	420	63.8	6.87	770	18.4	.582	7.83	-35.8	.44	clear none
1539	167'	10.01	560	63.9	6.87	755	13.3	.570	7.88	-35.9	.43	clear none
1540	Pump off	Back flush	hed	5x								
1553	Permeate	After Back flush		67.2	7.24	857	22.1	.622	9.07	-44.4	.47	clear none
1607	167'	10.05	700	65.8	6.91	814	9.24	.601	8.08	-39.5	.46	clear none
1621	167'	10.05	840	65.9	6.93	808	4.04	.595	8.04	-39.5	.45	clear none

pH Calibration (select two)				Conductivity Meter Calibration		Turbidimeter Calibration	
Buffer solution	pH 4.0	pH 7.0	pH 10.0	Solution	990	Standard	5.39
Instrument reading		7.0	10.0	Instrument reading	990	Instrument reading	5.39
		1410	1414		1419		1421

Notes: **Pumping 1st screened interval (155-175')**



**TOOELE ARMY DEPOT
MONITORING WELL SAMPLING DATA**

Well ID: 0-18	Initial Depth to Water: 141.66'
Sample ID:	Total Depth of Well: 208.47
Duplicate ID:	Well Diameter: 4"
Sample Depth:	(a) 1 Casing Volume: 44 gal
Date: 7/19/05	(b) 1 Filter Pack Water Volume:
Sampled By: JAT	(a) + (b) x 3 = Minimum Volume to Purge: 132 gal
Method of Sampling: Development 4" submersible	Method of Purging: Development 4" submersible

Time	Intake depth	Rate (gpm)	Cum. vol. (gal)	Temp (°F)	pH (units)	Conductivity (µS/cm)	Turbidity (NTUs)	TDS (g/L)	DO (mg/L)	ORP (mv)	Salinity (ppt)	Color & Sediment
0915	207'	10.18	840									
0929	207'	10.05	980	63.7	6.94	1053	16.8	.797	7.84	-19.2	.61	clear none
0943	207'	10.05	1,120	63.7	6.97	1030	4.09	.779	7.81	-20.5	.60	clear none
0957	207'	10.18	1,260	63.8	7.00	1013	2.25	.765	7.79	-22.0	.59	clear none
0958	Pump off for Recovery Portion of pump Test, Back flushed well 5x											
1021	Parameters after Back flush											
1035	207'	10.05	1,400	64.5	6.99	1000	2.95	.748	7.69	-25.7	.57	clear none
1036	Pump off Back flushed well 5x											
1045	Parameters after Back flush											
1059	207'	10.05	1,540	63.7	6.99	963	1.97	.727	7.89	-27.2	.56	clear none
1113	207'	10.18	1,680	63.8	7.02	952	1.31	.719	7.91	-27.9	.55	clear none
1127	207'	10.05	1,820	64.3	7.03	946	.97	.710	7.88	-28.8	.55	clear none

pH Calibration (select two)				Conductivity Meter Calibration		Turbidimeter Calibration	
Buffer solution	pH 4.0	pH 7.0	pH 10.0	Solution		Standard	
		7.0	10.0		990		5.39
Instrument reading		0854	0857	Instrument reading	990	Instrument reading	5.39
					0900		0903

Notes: **Pumping and screened interval (180' - 205')**

140

14

Monday July 18, 2005

Weather: Clear, Warm ~ 80°

Wind: Breeze From South

0802 Arrive at D-18 and start Setup

SWL 141.66 TD 208.47

0826 Calibrated Equipment

1030 MP Tanker on-site

1041 1st Bailer removed, Parameters Taken

1105 10th Bailer removed, Parameters Taken

1131 20th Bailer removed, Parameters Taken

1135 Surging well w/ surge block. Surging both
Screens (~155-~175) and (~180-205)

1222 30th Bailer Removed, Parameters Taken

1241 Surging well w/ surge block, Both screened intervals

1326 40th Bailer Removed, Parameters Taken

1335 Lowering Pump and piping

1403 Calibrated Equipment

1442 Pump on, establishing flow

1443 Flow established at 10 gpm, Intake 167

1540 Pump off, Backflushed 5x

1553 Pump on, parameters Taken after Backflush

1622 Pump off, Parameters Stable Turbidity 4.04 NTU'S

1627 Decon equipment

1658 Leaving D-18 → GWTP

Tuesday July 19 2005

Weather: Clear, Warm ~90°

Wind: None

- 0808 Arrive at D-18 and start Setup
0835 Adding 40ft of pipe, to pump and
Screened interval (-180-250 205')
0848 Calibrated equipment
0914 Pump on, establishing Flow. Pump Test
(Drawdown) started
0915 Flow established at 10.0 gpm, Intake 207'
0957 Pump off to Backflush and complete
recovery portion of pump Test
1036 Pump off, Backflushed well 5x
1127 Pump off, Parameters stable Turbidity at .97
1146 Removing pump and piping
1209 Decon Equipment
1219 Cleaning up Tools and equipment
around well site
1334 Leaving D-18 → GWTP

Measuring equipment Solinst water level meter

Date	Clock time	Time since pump started t	Time since pump stopped t'	t/t'	Depth to water level measurement	Correction or Conversion	Water level	Water level change s or s'	Discharge measurement	(Gpm) Rate
7/19	0914	0			141.75					Pumping Started
	0915	1			144.20				10.01	
	0916	2			144.54				10.15	
	0917	3			144.54				10.31	
	0920	6			144.54				10.18	
	0923	9			144.54				10.18	
	0925	11			144.54				10.18	
	0930	16			144.54				10.05	
	0935	21			144.56				10.18	
	0940	26			144.56				10.05	
	0945	31			144.56				10.18	
	0957	43			144.56				10.05	
	0958	44	1		142.63					
	0959	45	2		142.32					
	1000	46	3		141.74					
	1002	48	5		141.75					
	1005	51	8		141.75					
	1010	56	13		141.75					

APPENDIX F

September 15, 2005

Weather: Clear, Cool ~70°

Wind: Breeze from South

1012 Arrive at C-45 and start Setup

SWL 229.96 (BToc)

1150 Installed 5 samplers. 3 at 249 ft bgs, Top of Sampler, 1 at 259 ft bgs^(Top) and 1 at 269 ft bgs bottom of Sampler

1205 Leaving C-45 → D-17

1337 Arrive at D-17 and start Setup

SWL 112.53 (BToc)

1346 Installed 1 Sampler at 140 ft bgs, Top of Sampler

1354 Leaving D-17 → D-19

1357 Arrive at D-19 and start setup

SWL 133.00 (BToc)

1419 Installed 5 samplers. 3 at 148 ft bgs, Top of Sampler, 1 at 158 ft bgs, Top of Sampler and 1 at 168 ft bgs, bottom of Sampler

1431 Leaving D-19 → D-18

Arrive at D-18 and start Setup

SWL 142.98 (BToc)

1521 Installed 8 Samplers 3 at 155 ft bgs, Top of Sampler, 1 at 165 ft bgs, Top of Sampler and 1 at 175 ft bgs, bottom of Sampler. 1 at 180 ft bgs Top of Sampler, 1 at 192 ft bgs, Top of Sampler, and 1 at 205 ft bgs, Bottom of Sampler

1542 Leaving D-18 → GWTP

Tuesday October 4, 2005

Weather: Cloudy, Rain ~ 60°

Wind: None

0732 Arrive at CSH D-19 and preparing to sample

0754 Removing Samplers

15 VOA Samples Taken 40 mL w/HCL

(0805) (3) D-19 ED001 (148')

0758 (3) D-19 GW001 (148')

0758 (3) D-19 FR001 (148')

0807 (3) D-19 GW002 (158')

0810 (3) D-19 GW003 (168')

0821 Leaving D-19 → D-17

0826 Arrive at D-17 and preparing to sample

0834 Removing Samplers

³⁴ 0836 3 VOA Samples Taken 40 mL w/HCL

0836 (3) GW001 SH D-17 GW001 (140')

0843 Leaving D-17 → D-18

0849 Arrive at D-18 and preparing to sample

18 VOAs Taken 40 mL w/HCL

0920 (3) D-18 GW007 (155')

0924 (3) D-18 GW008 (165')

0927 (3) D-18 GW009 (175')

0930 (3) D-18 GW010 (180')

0933 (3) D-18 GW011 (192')

0936 (3) D-18 GW012 (205')

0952 Leaving D-18 → GWTP

1502 Arrive at C-48F and preparing to sample

1512 Removing samplers

12 VOA Samples Taken 40 mL w/HCL

1516 (3) C-48F GW001 (355')

1519 (3) C-48F GW002 (363')

1522 (3) C-48F GW003 (371')

1526 (3) C-48F GW004 (379')

Tuesday October 11, 2005

Weather: Clear, Cool ~ 50°

Wind: None

- 0911 Arrive at D-18 and start Setup,
 10 Cation Samples & Taken via Kabis
 Sampler, 500 mL poly w/ HNO₃
 10 Anion/Alkalinity Samples Taken via Kabis
 Sampler, 500 mL poly, No preservative
- (1037) (1) D-18 FD001 (Cations) @ 155' bgs
 (1044) (1) D-18 FD001 (Anion/Alkalinity) @ 155' bgs
 1055 (1) D-18 GW001 (Cations) @ 155' bgs
 1101 (1) D-18 GW001 (Anions/Alkalinity) @ 155' bgs
 1105 (1) D-18 MS001 (Cations) @ 155' bgs
 1109 (1) D-18 MS001 (Anions/Alkalinity) at 155' bgs
 1113 (1) D-18 SD001 (Cations) at 155' bgs
 1118 (1) D-18 SD001 (Anions/Alkalinity) at 155' bgs
 1125 (1) D-18 FR001 (Cations) at 155' bgs
 1128 (1) D-18 FR001 (Anions/Alkalinity) at 155' bgs
 1138 (1) D-18 GW002 (Cations) at 165' bgs
 1144 (1) D-18 GW002 (Anions/Alkalinity) at 165' bgs
 1151 (1) D-18 GW003 (Cations) at 175' bgs
 1156 (1) D-18 GW003 (Anions/Alkalinity) at 175' bgs
 1209 (1) D-18 GW004 (Cations) at 180' bgs
 1215 (1) D-18 GW004 (Anions/Alkalinity) at 180' bgs
 1223 (1) D-18 GW005 (Cations) at 192 ft bgs
 1229 (1) D-18 GW005 (Anions/Alkalinity) at 192 ft bgs
 1240 (1) D-18 GW006 (Cations) at 205' bgs
 1247 (1) D-18 GW006 (Anions/Alkalinity) at 205' bgs
 1255 Decon Sampler
 1333 Leaving D-18 → GUTP

Sample Parameters

Time	Depth (Feet)	pH (unit's)	Temp (° F)	Conductivity (μ S/cm)	Turbidity (NTU's)
1039	155	7.83	53.5	1207	28.8
1139	165	7.78	54.4	1210	194
1152	175	7.84	54.9	1217	240
1210	180	7.86	55.1	1206	175
1234	192	7.83	55.2	1209	283
1341	205	7.71	55.5	1199	322

1505 Arrive at C-47F and preparing to sample
12 VOA'S Taken 40 mi w/HCL

1515 (3) C-47F Gw001 (357)

1519 (3) C-47F Gw002 (364)

1523 (3) C-47F Gw003 (372)

1528 (3) C-47F Gw004 (379)

1540 Leaving C-47F to deliver samples to Kurt A.
at patsons field office

ANALYTICAL QUALITY CONTROL SUMMARY

Samples were collected in accordance with the analytical and quality control specifications of the Final Phase II RCRA Facility Investigation SWMU-58 Work Plan (Parsons, 2003) and the Tooele Industrial Area Project CDQMP and QAPP. Passive diffusion bag samplers were deployed in well D-18 on September 15, 2005. Passive diffusion bag samples including field quality control samples were collected on October 4, 2005 and Kabis samples including field quality control samples were collected on October 11, 2005 and submitted to Severn Trent Laboratories, a Utah and USACE-certified analytical laboratory.

Results were received and submitted to third party data review by Synectics. Data review included checks of the following data quality elements: Holding times, continuing calibration verification, method blanks, field blanks, laboratory control sample recovery, matrix spike and matrix spike duplicate recovery and precision, surrogate recovery, and field duplicate precision. There were minor quality control issues found in the data packages for D-18. The TCE results were J/UJ flagged for reanalysis holding times >14 days. 1,1-dichloroethene results were J/UJ flagged due to LCS % recovery issues. Sodium, calcium, and potassium were detected in the lab blanks. Data for these compounds was U/None flagged for blank contamination. All data is suitable for use. Analytical and data validation reports are attached.

**STL[®]**

STL Sacramento
880 Riverside Parkway
West Sacramento, CA 95605

Tel: 916 373 5600 Fax: 916 372 1059
www.stl-inc.com

October 30, 2005

STL SACRAMENTO PROJECT NUMBER: G5J070276
PO/CONTRACT: 744139-30012

Jan Barbas
Parsons
406 West South Jordan Parkway
Suite 300
South Jordan, UT 84095

Dear Mr. Barbas,

This report contains the analytical results for the samples received under chain of custody by STL Sacramento on October 6, 2005. These samples are associated with your Tooele project.

The test results in this report meet all NELAC requirements for parameters that accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The case narrative is an integral part of this report.

If you have any questions, please feel free to call me at (916) 374-4427.

Sincerely,

Nilo Ligi
Project Manager

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CASE NARRATIVE

STL SACRAMENTO PROJECT NUMBER G5J070276

General Comments

Samples were received at 2 degrees C.

WATER, 8260B, Volatile Organics

The samples were analysed for Volatile Organics by Method 8260B (GC-MS).
Detection is achieved by purge and trap gas chromatography – Mass Spectrometry.
All QC criteria were met except as noted below.

Samples 6, 8, 9, 10-14

Samples were all analyzed before the holding time expired. However, review of the data showed that 1 or more analytes were present in the sample at levels outside of the instrument calibration range. As a consequence, these samples were reanalyzed at dilutions, but the reanalysis was past the holding time date. Both sets of data will be reported.

Due to possible carry over contribution sample G5J070276-14 was reanalyzed two days beyond recommended hold time. Results for both analyses are reported.

There were no other anomalies associated with this project.

STL Sacramento Certifications/Accreditations

Certifying State	Certificate #	Certifying State	Certificate #
Alaska	UST-055	Oregon*	CA 200005
Arizona	AZ0616	Pennsylvania	68-1272
Arkansas	04-067-0	South Carolina	87014002
California	011106A	Texas	TX 2702004A
Colorado	NA	Utah*	QUANI
Connecticut	PH-0691	Virginia	001786
Florida*	E87570	Washington	C087
Georgia	9601	West Virginia	99305334
Hawaii	NA	Wisconsin	998204680
Idaho	010124	WYBSC	NA
Illinois	9947	USACE	NA
Indiana	CA024	USDA Foreign Plant	32605
Michigan	9947	USDA Foreign Soil	S-46613
Minnesota	CA005		
New Jersey*	CA005		
New York	1666		

*NELAP accredited. A more detailed parameter list is available upon request. Update 1/27/05

QC Parameter Definitions

QC Batch: The QC batch consists of a set of up to 20 field samples that behave similarly (i.e., same matrix) and are processed using the same procedures, reagents, and standards at the same time.

Method Blank: An analytical control consisting of all reagents, which may include internal standards and surrogates, and is carried through the entire analytical procedure. The method blank is used to define the level of laboratory background contamination.

Laboratory Control Sample and Laboratory Control Sample Duplicate (LCS/LCSD): An aliquot of blank matrix spiked with known amounts of representative target analytes. The LCS (and LCSD as required) is carried through the entire analytical process and is used to monitor the accuracy of the analytical process independent of potential matrix effects. If an LCSD is performed, it may also be used to evaluate the precision of the process.

Duplicate Sample (DU): Different aliquots of the same sample are analyzed to evaluate the precision of an analysis.

Surrogates: Organic compounds not expected to be detected in field samples, which behave similarly to target analytes. These are added to every sample within a batch at a known concentration to determine the efficiency of the sample preparation and analytical process.

Matrix Spike and Matrix Spike Duplicate (MS/MSD): An MS is an aliquot of a matrix fortified with known quantities of specific compounds and subjected to an entire analytical procedure in order to indicate the appropriateness of the method for a particular matrix. The percent recovery for the respective compound(s) is then calculated. The MSD is a second aliquot of the same matrix as the matrix spike, also spiked, in order to determine the precision of the method.

Isotope Dilution: For isotope dilution methods, isotopically labeled analogs (internal standards) of the native target analytes are spiked into the sample at time of extraction. These internal standards are used for quantitation, and monitor and correct for matrix effects. Since matrix effects on method performance can be judged by the recovery of these analogs, there is little added benefit of performing MS/MSD for these methods. MS/MSD are only performed for client or QAPP requirements.

Control Limits: The reported control limits are either based on laboratory historical data, method requirements, or project data quality objectives. The control limits represent the estimated uncertainty of the test results.

Sample Summary

G5J070276

<u>WO#</u>	<u>Sample #</u>	<u>Client Sample ID</u>	<u>Sampling Date</u>	<u>Received Date</u>
HL9K7	1	D-19FD001	10/4/2005 08:05 AM	10/6/2005 09:10 AM
HL9LG	2	D-19GW001	10/4/2005 07:58 AM	10/6/2005 09:10 AM
HL9LR	3	D-19GW002	10/4/2005 08:07 AM	10/6/2005 09:10 AM
HL9LX	4	D-19GW003	10/4/2005 08:10 AM	10/6/2005 09:10 AM
HL9L4	5	D-17GW001	10/4/2005 08:36 AM	10/6/2005 09:10 AM
HL9L5	6	C-45FD001	10/3/2005 08:50 AM	10/6/2005 09:10 AM
HL9L8	7	C-45GW001	10/3/2005 08:41 AM	10/6/2005 09:10 AM
HL9MD	8	C-45GW002	10/3/2005 09:03 AM	10/6/2005 09:10 AM
HL9MH	9	C-45GW003	10/3/2005 09:08 AM	10/6/2005 09:10 AM
HL9MJ	10	C-48FGW001	10/4/2005 03:16 PM	10/6/2005 09:10 AM
HL9ML	11	C-48FGW002	10/4/2005 03:19 PM	10/6/2005 09:10 AM
HL9MQ	12	C-48FGW003	10/4/2005 03:22 PM	10/6/2005 09:10 AM
HL9MX	13	C-48FGW004	10/4/2005 03:26 PM	10/6/2005 09:10 AM
HL9M3	14	D-18GW007	10/4/2005	10/6/2005 09:10 AM
HL9NL	15	D-18GW008	10/4/2005	10/6/2005 09:10 AM
HL9NP	16	D-18GW009	10/4/2005	10/6/2005 09:10 AM
HL9NT	17	D-18GW010	10/4/2005	10/6/2005 09:10 AM
HL9NW	18	D-18GW011	10/4/2005	10/6/2005 09:10 AM
HL9N3	19	D-18GW012	10/4/2005	10/6/2005 09:10 AM
HL9N5	20	PARSTB12	10/3/2005 07:00 AM	10/6/2005 09:10 AM

Notes(s):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity, pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight

SAMPLE RECEIPT RECORDS

CHAIN OF CUSTODY PARSONS COC ID: 1008		Project Name: Tooele Industrial Area		Contractor: Parsons-SLC		Parsons Point of Contact: Jan Barbas 406 W. South Jordan Parkway Suite 300 South Jordan, Utah 84095 (801) 572-5999 FAX (801) 572-9069						
		Project Manager: Ed Staes		Installation: TEAD								
		Sample Coordinator: Kurt Alloway		Sample Program:								
Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
D-18	D-18	D-18GW007	WG	DF	N	1	10/4/05		JND	155'	-	3
Analysis		Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot	Remarks:				
VOC		SVLS										

 RECEIVED IN GOOD-CONDITION
 UNDER COC

OCT 06 2005

INI

JS

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
Jeff Sturman	10/5/05 1000	[Signature]	10/05/05 1000
[Signature] TO FED Ex	10/5/05 1630	[Signature]	10/6/05 1440

To: STL Laboratories, 880 Riverside Pkwy, W. Sacramento, CA, 95605 (916) 373-5600

Friday, September 16, 2005

Page 1 of 1

CHAIN OF CUSTODY
PARSONS

COC ID: 1009

Project Name: Tooele Industrial Area Contractor: Parsons-SLC
 Project Manager: Ed Staes Installation: TEAD
 Sample Coordinator: Kurt Alloway Sample Program:

Parsons Point of Contact: Jan Barbas
 406 W. South Jordan Parkway
 Suite 300
 South Jordan, Utah 84095
 (801) 572-5999 FAX (801) 572-9069

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Cnts.
D-18	D-18	D-18GW008	WG	DF	N	1	10/4/05		gnd	165'	-	3
Analysis		Lab	Cooler	No. Cnts	AB Lot	EB Lot	TB Lot	Remarks:				
VOC		SVLS										

 RECEIVED IN GOOD CONDITION
 UNDER COC

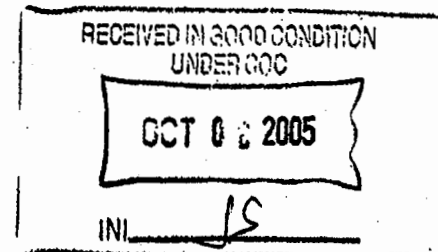
OCT 06 2005

INL

JS

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
<i>[Signature]</i>	10/5/05 1000	<i>[Signature]</i>	10/5/05 1000
<i>[Signature]</i> TO F&S Ex	10/5/05 1630	<i>[Signature]</i>	10/16/05 1440

CHAIN OF CUSTODY PARSONS COC ID: 1010		Project Name: Tooele Industrial Area		Contractor: Parsons-SLC		Parsons Point of Contact: Jan Barbas 406 W. South Jordan Parkway Suite 300 South Jordan, Utah 84095 (801) 572-5999 FAX (801) 572-9069						
		Project Manager: Ed Staes		Installation: TEAD								
		Sample Coordinator: Kurt Alloway		Sample Program:								
Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
D-18	D-18	D-18GW009	WG	DF	N	1	10/4/05		JS	175'	-	3
Analysis		Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot	Remarks:				
VOC		SVLS										



Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
<i>[Signature]</i>	10/5/05 1000	<i>[Signature]</i>	10/5/05 1000
<i>[Signature]</i>	10/5/05 1630	<i>[Signature]</i>	10/6/05

To: STL Laboratories, 880 Riverside Pkwy, W. Sacramento, CA, 95605 (916) 373-5600

Friday, September 16, 2005

Page 1 of 1

CHAIN OF CUSTODY PARSONS COC ID: 1011		Project Name: Tooele Industrial Area		Contractor: Parsons-SLC		Parsons Point of Contact: Jan Barbas 406 W. South Jordan Parkway Suite 300 South Jordan, Utah 84095 (801) 572-5999 FAX (801) 572-9069						
		Project Manager: Ed Staes		Installation: TEAD								
		Sample Coordinator: Kurt Alloway		Sample Program:								
Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
D-18	D-18	D-18GW010	WG	DF	N	1	10/4/05		JN	180'	-	3
Analysis		Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot	Remarks:				
VOC		SVLS										

 RECEIVED IN GOOD CONDITION
 UNDER COC

OCT 6 2005

 INI JS

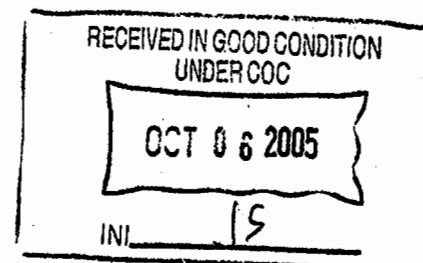
Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
<i>Jeff Hammer</i>	10/5/05 1000	<i>[Signature]</i>	10/5/05 1200
<i>[Signature] To FedEx</i>	10/5/05 1630	<i>[Signature]</i>	10/6/05 1440

To: STL Laboratories, 880 Riverside Pkwy, W. Sacramento, CA, 95605 (916) 373-5600

Friday, September 16, 2005

Page 1 of 1

CHAIN OF CUSTODY PARSONS COC ID: 1012		Project Name: Tooele Industrial Area		Contractor: Parsons-SLC		Parsons Point of Contact: Jan Barbas 406 W. South Jordan Parkway Suite 300 South Jordan, Utah 84095 (801) 572-5999 FAX (801) 572-9089						
		Project Manager: Ed Staes		Installation: TEAD								
		Sample Coordinator: Kurt Alloway		Sample Program:								
Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
D-18	D-18	D-18GW011	WG	DF	N	1	10/4/05		gn	192'	-	3
Analysis		Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot	Remarks:				
VOC		SVLS										



Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
<i>[Signature]</i>	10/5/05 1000	<i>[Signature]</i>	10/5/05 1000
<i>[Signature]</i> TO FedEx	10/5/05 1630	<i>[Signature]</i>	10/6/05 1440

CHAIN OF CUSTODY PARSONS COC ID: 1013		Project Name: Tooele Industrial Area		Contractor: Parsons-SLC		Parsons Point of Contact: Jan Barbas 406 W. South Jordan Parkway Suite 300 South Jordan, Utah 84095 (801) 572-5999 FAX (801) 572-9069						
		Project Manager: Ed Staes		Installation: TEAD								
		Sample Coordinator: Kurt Alloway		Sample Program:								
Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
D-18	D-18	D-18GW012	WG	DF	N	1	10/4/05		gna	205'	-	3
Analysis		Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot	Remarks:				
VOC		SVLS										

 RECEIVED IN GOOD CONDITION
 UNDER COC

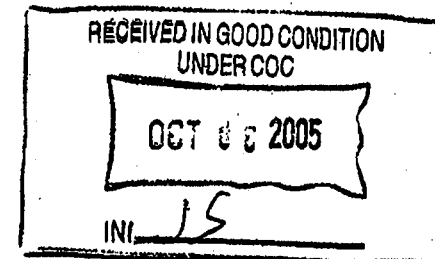
OCT 0 8 2005

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15

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
<i>[Signature]</i>	10/5/05 1000	<i>[Signature]</i>	10/5/05 1000
<i>[Signature]</i> Fed Ex	10/5/05 1630	<i>[Signature]</i>	10/6/05 1440

CHAIN OF CUSTODY PARSONS COC ID: 1018		Project Name: Tooele Industrial Area		Contractor: Parsons-SLC		Parsons Point of Contact: Jan Barbas 406 W. South Jordan Parkway Suite 300 South Jordan, Utah 84095 (801) 572-5999 FAX (801) 572-9069						
		Project Manager: Ed Staes		Installation: TEAD								
		Sample Coordinator: Kurt Alloway		Sample Program:								
Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
	FIELDQC	PARSTB12	WQ	NA	TB	1	10/3/05	0700	gnt	0	0	2
Analysis		Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot	Remarks:				
VOC		SVLS										



Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
<i>[Signature]</i>	10/5/05 0800	<i>[Signature]</i>	10/5/05 0800
<i>[Signature]</i> To: FedEx	10/5/05 1600	<i>[Signature]</i>	10/10/05 1440

SEVERN
TRENT

STL

LOT RECEIPT CHECKLIST
STL Sacramento

CLIENT Parsons PM N LOG # 34926
LOT# (QUANTIMS ID) G55070276 QUOTE# 62837 LOCATION VB

DATE RECEIVED 10/6/05 TIME RECEIVED 0916

Initials JS Date 10/6/05

DELIVERED BY ☒ FEDEX ☐ CA OVERNIGHT ☐ CLIENT
☐ AIRBORNE ☐ GOLDENSTATE ☐ DHL
☐ UPS ☐ BAX GLOBAL ☐ GO-GETTERS
☐ STL COURIER ☐ COURIERS ON DEMAND
☐ OTHER

CUSTODY SEAL STATUS ☒ INTACT ☐ BROKEN ☐ N/A

CUSTODY SEAL #(S) 396684 396684, 438930

SHIPPING CONTAINER(S) ☐ STL ☒ CLIENT ☐ N/A

TEMPERATURE RECORD (IN °C) IR ☒ 1 ☐ 3 ☐ OTHER

COC #(S) N/A

TEMPERATURE BLANK Observed: 2 Corrected: 2

SAMPLE TEMPERATURE

Observed: 2 2 3 Average: 2 Corrected Average: 2

COLLECTOR'S NAME: ☐ Verified from COC ☒ Not on COC

pH MEASURED ☐ YES ☐ ANOMALY ☒ N/A

LABELED BY.....

LABELS CHECKED BY.....

PEER REVIEW ☒ NA

SHORT HOLD TEST NOTIFICATION

SAMPLE RECEIVING

WETCHEM ☒ N/A

VOA-ENCORES ☒ N/A

☐ METALS NOTIFIED OF FILTER/PRESERVE VIA VERBAL & EMAIL ☒ N/A

☒ COMPLETE SHIPMENT RECEIVED IN GOOD CONDITION WITH
APPROPRIATE TEMPERATURES, CONTAINERS, PRESERVATIVES ☐ N/A

☐ Clouseau ☐ TEMPERATURE EXCEEDED (2 °C - 6 °C)*1 ☒ N/A

☐ WET ICE ☐ BLUE ICE ☐ GEL PACK ☐ NO COOLING AGENTS USED ☐ PM NOTIFIED

Notes: _____

WATER, 8260B, Volatile Organics

Parsons Corporation

Client Sample ID: D-18GW007

GC/MS Volatiles

Lot-Sample #....: G5J070276-014 Work Order #....: HL9M31AA Matrix.....: WG
 Date Sampled....: 10/04/05 Date Received...: 10/06/05
 Prep Date.....: 10/18/05 Analysis Date...: 10/18/05
 Prep Batch #....: 5292173
 Dilution Factor: 1 Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Benzene	ND	1.0	ug/L	0.13
Carbon tetrachloride	ND	1.0	ug/L	0.15
Chloroethane	ND	1.0	ug/L	0.34
Chloroform	ND	1.0	ug/L	0.12
1,1-Dichloroethane	ND	1.0	ug/L	0.10
1,2-Dichloroethane	ND	1.0	ug/L	0.22
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.10
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.11
1,1-Dichloroethene	ND	1.0	ug/L	0.36
1,2-Dichloropropane	ND	1.0	ug/L	0.15
Ethylbenzene	ND	1.0	ug/L	0.27
Methylene chloride	ND	2.0	ug/L	0.35
Naphthalene	ND	1.0	ug/L	0.15
Tetrachloroethene	ND	1.0	ug/L	0.38
Toluene	ND	1.0	ug/L	0.25
1,1,1-Trichloroethane	ND	1.0	ug/L	0.41
1,1,2-Trichloroethane	ND	1.0	ug/L	0.31
Trichloroethene	5.0	1.0	ug/L	0.31
Vinyl chloride	ND	1.0	ug/L	0.12
m-Xylene & p-Xylene	ND	1.0	ug/L	0.18
o-Xylene	ND	1.0	ug/L	0.10

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	102	(70 - 130)
1,2-Dichloroethane-d4	103	(70 - 130)
Toluene-d8	109	(70 - 130)
Dibromofluoromethane	107	(70 - 130)

Parsons Corporation

Client Sample ID: D-18GW008

GC/MS Volatiles

Lot-Sample #....: G5J070276-015 Work Order #....: HL9NL1AA Matrix.....: WG
 Date Sampled....: 10/04/05 Date Received...: 10/06/05
 Prep Date.....: 10/18/05 Analysis Date...: 10/18/05
 Prep Batch #....: 5292173
 Dilution Factor: 1 Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING		
		LIMIT	UNITS	MDL
Benzene	ND	1.0	ug/L	0.13
Carbon tetrachloride	ND	1.0	ug/L	0.15
Chloroethane	ND	1.0	ug/L	0.34
Chloroform	ND	1.0	ug/L	0.12
1,1-Dichloroethane	ND	1.0	ug/L	0.10
1,2-Dichloroethane	ND	1.0	ug/L	0.22
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.10
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.11
1,1-Dichloroethene	ND	1.0	ug/L	0.36
1,2-Dichloropropane	ND	1.0	ug/L	0.15
Ethylbenzene	ND	1.0	ug/L	0.27
Methylene chloride	ND	2.0	ug/L	0.35
Naphthalene	ND	1.0	ug/L	0.15
Tetrachloroethene	ND	1.0	ug/L	0.38
Toluene	ND	1.0	ug/L	0.25
1,1,1-Trichloroethane	ND	1.0	ug/L	0.41
1,1,2-Trichloroethane	ND	1.0	ug/L	0.31
Trichloroethene	4.4	1.0	ug/L	0.31
Vinyl chloride	ND	1.0	ug/L	0.12
m-Xylene & p-Xylene	ND	1.0	ug/L	0.18
o-Xylene	ND	1.0	ug/L	0.10
SURROGATE	PERCENT		RECOVERY	
	RECOVERY		LIMITS	
4-Bromofluorobenzene	103		(70 - 130)	
1,2-Dichloroethane-d4	106		(70 - 130)	
Toluene-d8	111		(70 - 130)	
Dibromofluoromethane	110		(70 - 130)	

Parsons Corporation

Client Sample ID: D-18GW009

GC/MS Volatiles

Lot-Sample #....: G5J070276-016 Work Order #....: HL9NP1AA Matrix.....: WG
 Date Sampled....: 10/04/05 Date Received...: 10/06/05
 Prep Date.....: 10/18/05 Analysis Date...: 10/18/05
 Prep Batch #....: 5292302
 Dilution Factor: 1 Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING		
		LIMIT	UNITS	MDL
Benzene	ND	1.0	ug/L	0.13
Carbon tetrachloride	0.15 J	1.0	ug/L	0.15
Chloroethane	ND	1.0	ug/L	0.34
Chloroform	ND	1.0	ug/L	0.12
1,1-Dichloroethane	ND	1.0	ug/L	0.10
1,2-Dichloroethane	ND	1.0	ug/L	0.22
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.10
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.11
1,1-Dichloroethene	ND	1.0	ug/L	0.36
1,2-Dichloropropane	ND	1.0	ug/L	0.15
Ethylbenzene	ND	1.0	ug/L	0.27
Methylene chloride	ND	2.0	ug/L	0.35
Naphthalene	ND	1.0	ug/L	0.15
Tetrachloroethene	ND	1.0	ug/L	0.38
Toluene	ND	1.0	ug/L	0.25
1,1,1-Trichloroethane	ND	1.0	ug/L	0.41
1,1,2-Trichloroethane	ND	1.0	ug/L	0.31
Trichloroethene	3.9	1.0	ug/L	0.31
Vinyl chloride	ND	1.0	ug/L	0.12
m-Xylene & p-Xylene	ND	1.0	ug/L	0.18
o-Xylene	ND	1.0	ug/L	0.10

SURROGATE	PERCENT	RECOVERY
	RECOVERY	LIMITS
4-Bromofluorobenzene	114	(70 - 130)
1,2-Dichloroethane-d4	125	(70 - 130)
Toluene-d8	121	(70 - 130)
Dibromofluoromethane	122	(70 - 130)

NOTE(S):

J Estimated result. Result is less than RL.

Parsons Corporation

Client Sample ID: D-18GW010

GC/MS Volatiles

Lot-Sample #....: G5J070276-017 Work Order #....: HL9NT1AA Matrix.....: WG
 Date Sampled....: 10/04/05 Date Received...: 10/06/05
 Prep Date.....: 10/18/05 Analysis Date...: 10/18/05
 Prep Batch #....: 5292302
 Dilution Factor: 1 Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Benzene	ND	1.0	ug/L	0.13
Carbon tetrachloride	ND	1.0	ug/L	0.15
Chloroethane	ND	1.0	ug/L	0.34
Chloroform	ND	1.0	ug/L	0.12
1,1-Dichloroethane	ND	1.0	ug/L	0.10
1,2-Dichloroethane	ND	1.0	ug/L	0.22
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.10
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.11
1,1-Dichloroethene	ND	1.0	ug/L	0.36
1,2-Dichloropropane	ND	1.0	ug/L	0.15
Ethylbenzene	ND	1.0	ug/L	0.27
Methylene chloride	ND	2.0	ug/L	0.35
Naphthalene	ND	1.0	ug/L	0.15
Tetrachloroethene	ND	1.0	ug/L	0.38
Toluene	ND	1.0	ug/L	0.25
1,1,1-Trichloroethane	ND	1.0	ug/L	0.41
1,1,2-Trichloroethane	ND	1.0	ug/L	0.31
Trichloroethene	3.7	1.0	ug/L	0.31
Vinyl chloride	ND	1.0	ug/L	0.12
m-Xylene & p-Xylene	ND	1.0	ug/L	0.18
o-Xylene	ND	1.0	ug/L	0.10

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	112	(70 - 130)
1,2-Dichloroethane-d4	119	(70 - 130)
Toluene-d8	117	(70 - 130)
Dibromofluoromethane	118	(70 - 130)

Parsons Corporation

Client Sample ID: D-18GW011

GC/MS Volatiles

Lot-Sample #....: G5J070276-018 Work Order #....: HL9NW1AA Matrix.....: WG
 Date Sampled....: 10/04/05 Date Received...: 10/06/05
 Prep Date.....: 10/18/05 Analysis Date...: 10/18/05
 Prep Batch #....: 5292302
 Dilution Factor: 1 Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Benzene	ND	1.0	ug/L	0.13
Carbon tetrachloride	0.16 J	1.0	ug/L	0.15
Chloroethane	ND	1.0	ug/L	0.34
Chloroform	ND	1.0	ug/L	0.12
1,1-Dichloroethane	ND	1.0	ug/L	0.10
1,2-Dichloroethane	ND	1.0	ug/L	0.22
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.10
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.11
1,1-Dichloroethene	ND	1.0	ug/L	0.36
1,2-Dichloropropane	ND	1.0	ug/L	0.15
Ethylbenzene	ND	1.0	ug/L	0.27
Methylene chloride	ND	2.0	ug/L	0.35
Naphthalene	ND	1.0	ug/L	0.15
Tetrachloroethene	ND	1.0	ug/L	0.38
Toluene	ND	1.0	ug/L	0.25
1,1,1-Trichloroethane	ND	1.0	ug/L	0.41
1,1,2-Trichloroethane	ND	1.0	ug/L	0.31
Trichloroethene	3.8	1.0	ug/L	0.31
Vinyl chloride	ND	1.0	ug/L	0.12
m-Xylene & p-Xylene	ND	1.0	ug/L	0.18
o-Xylene	ND	1.0	ug/L	0.10
SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS		
4-Bromofluorobenzene	115	(70 - 130)		
1,2-Dichloroethane-d4	125	(70 - 130)		
Toluene-d8	120	(70 - 130)		
Dibromofluoromethane	125	(70 - 130)		

NOTE(S) :

J Estimated result. Result is less than RL.

Parsons Corporation

Client Sample ID: D-18GW012

GC/MS Volatiles

Lot-Sample #....: G5J070276-019 Work Order #....: HL9N31AA Matrix.....: WG
 Date Sampled...: 10/04/05 Date Received...: 10/06/05
 Prep Date.....: 10/18/05 Analysis Date...: 10/18/05
 Prep Batch #....: 5292302
 Dilution Factor: 1 Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING		
		LIMIT	UNITS	MDL
Benzene	ND	1.0	ug/L	0.13
Carbon tetrachloride	ND	1.0	ug/L	0.15
Chloroethane	ND	1.0	ug/L	0.34
Chloroform	ND	1.0	ug/L	0.12
1,1-Dichloroethane	ND	1.0	ug/L	0.10
1,2-Dichloroethane	ND	1.0	ug/L	0.22
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.10
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.11
1,1-Dichloroethene	ND	1.0	ug/L	0.36
1,2-Dichloropropane	ND	1.0	ug/L	0.15
Ethylbenzene	ND	1.0	ug/L	0.27
Methylene chloride	ND	2.0	ug/L	0.35
Naphthalene	ND	1.0	ug/L	0.15
Tetrachloroethene	ND	1.0	ug/L	0.38
Toluene	ND	1.0	ug/L	0.25
1,1,1-Trichloroethane	ND	1.0	ug/L	0.41
1,1,2-Trichloroethane	ND	1.0	ug/L	0.31
Trichloroethene	3.8	1.0	ug/L	0.31
Vinyl chloride	ND	1.0	ug/L	0.12
m-Xylene & p-Xylene	ND	1.0	ug/L	0.18
o-Xylene	ND	1.0	ug/L	0.10
SURROGATE	PERCENT		RECOVERY	
	RECOVERY		LIMITS	
4-Bromofluorobenzene	116		(70 - 130)	
1,2-Dichloroethane-d4	121		(70 - 130)	
Toluene-d8	120		(70 - 130)	
Dibromofluoromethane	122		(70 - 130)	

Parsons Corporation

Client Sample ID: PARSTB12

GC/MS Volatiles

Lot-Sample #....: G5J070276-020 Work Order #....: HL9N51AA Matrix.....: WQ
 Date Sampled....: 10/03/05 Date Received...: 10/06/05
 Prep Date.....: 10/17/05 Analysis Date...: 10/17/05
 Prep Batch #....: 5291444
 Dilution Factor: 1 Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Benzene	ND	1.0	ug/L	0.13
Carbon tetrachloride	ND	1.0	ug/L	0.15
Chloroethane	ND	1.0	ug/L	0.34
Chloroform	ND	1.0	ug/L	0.12
1,1-Dichloroethane	ND	1.0	ug/L	0.10
1,2-Dichloroethane	ND	1.0	ug/L	0.22
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.10
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.11
1,1-Dichloroethene	ND	1.0	ug/L	0.36
1,2-Dichloropropane	ND	1.0	ug/L	0.15
Ethylbenzene	ND	1.0	ug/L	0.27
Methylene chloride	ND	2.0	ug/L	0.35
Naphthalene	ND	1.0	ug/L	0.15
Tetrachloroethene	ND	1.0	ug/L	0.38
Toluene	ND	1.0	ug/L	0.25
1,1,1-Trichloroethane	ND	1.0	ug/L	0.41
1,1,2-Trichloroethane	ND	1.0	ug/L	0.31
Trichloroethene	ND	1.0	ug/L	0.31
Vinyl chloride	ND	1.0	ug/L	0.12
m-Xylene & p-Xylene	ND	1.0	ug/L	0.18
o-Xylene	ND	1.0	ug/L	0.10

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	104	(70 - 130)
1,2-Dichloroethane-d4	93	(70 - 130)
Toluene-d8	107	(70 - 130)
Dibromofluoromethane	98	(70 - 130)

QC DATA ASSOCIATION SUMMARY

G5J070276

Sample Preparation and Analysis Control Numbers

<u>SAMPLE#</u>	<u>MATRIX</u>	<u>ANALYTICAL METHOD</u>	<u>LEACH BATCH #</u>	<u>PREP BATCH #</u>	<u>MS RUN#</u>
001	WG	SW846 8260B		5292173	
002	WG	SW846 8260B		5292173	
003	WG	SW846 8260B		5292173	
004	WG	SW846 8260B		5292173	
005	WG	SW846 8260B		5292173	
006	WG	SW846 8260B		5291444	5291272
007	WG	SW846 8260B		5291444	5291272
008	WG	SW846 8260B		5291444	5291272
009	WG	SW846 8260B		5291444	5291272
010	WG	SW846 8260B		5292173	
011	WG	SW846 8260B		5292173	
012	WG	SW846 8260B		5292173	
013	WG	SW846 8260B		5292173	
014	WG	SW846 8260B		5292173	
015	WG	SW846 8260B		5292173	
016	WG	SW846 8260B		5292302	
017	WG	SW846 8260B		5292302	
018	WG	SW846 8260B		5292302	
019	WG	SW846 8260B		5292302	
020	WQ	SW846 8260B		5291444	5291272

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #....: G5J070276
MB Lot-Sample #: G5J180000-444

Work Order #....: HMLJ21AA

Matrix.....: WATER

Prep Date.....: 10/17/05

Analysis Date...: 10/17/05

Prep Batch #....: 5291444

Dilution Factor: 1

PARAMETER	RESULT	REPORTING			METHOD
		LIMIT	UNITS		
Benzene	ND	1.0	ug/L		SW846 8260B
Carbon tetrachloride	ND	1.0	ug/L		SW846 8260B
Chloroethane	ND	1.0	ug/L		SW846 8260B
Chloroform	ND	1.0	ug/L		SW846 8260B
1,1-Dichloroethane	ND	1.0	ug/L		SW846 8260B
1,2-Dichloroethane	ND	1.0	ug/L		SW846 8260B
1,1-Dichloroethene	ND	1.0	ug/L		SW846 8260B
cis-1,2-Dichloroethene	ND	1.0	ug/L		SW846 8260B
trans-1,2-Dichloroethene	ND	1.0	ug/L		SW846 8260B
1,2-Dichloropropane	ND	1.0	ug/L		SW846 8260B
Ethylbenzene	ND	1.0	ug/L		SW846 8260B
Methylene chloride	ND	2.0	ug/L		SW846 8260B
Naphthalene	ND	1.0	ug/L		SW846 8260B
Tetrachloroethene	ND	1.0	ug/L		SW846 8260B
Toluene	ND	1.0	ug/L		SW846 8260B
1,1,1-Trichloroethane	ND	1.0	ug/L		SW846 8260B
1,1,2-Trichloroethane	ND	1.0	ug/L		SW846 8260B
Trichloroethene	ND	1.0	ug/L		SW846 8260B
Vinyl chloride	ND	1.0	ug/L		SW846 8260B
o-Xylene	ND	1.0	ug/L		SW846 8260B
m-Xylene & p-Xylene	ND	1.0	ug/L		SW846 8260B

SURROGATE	PERCENT	RECOVERY
	RECOVERY	LIMITS
4-Bromofluorobenzene	105	(70 - 130)
1,2-Dichloroethane-d4	89	(70 - 130)
Toluene-d8	102	(70 - 130)
Dibromofluoromethane	92	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #....: G5J070276
MB Lot-Sample #: G5J190000-173

Work Order #....: HM2P71AA

Matrix.....: WATER

Analysis Date...: 10/18/05

Prep Date.....: 10/18/05

Prep Batch #....: 5292173

Dilution Factor: 1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Benzene	ND	1.0	ug/L	SW846 8260B
Carbon tetrachloride	ND	1.0	ug/L	SW846 8260B
Chloroethane	ND	1.0	ug/L	SW846 8260B
Chloroform	ND	1.0	ug/L	SW846 8260B
1,1-Dichloroethane	ND	1.0	ug/L	SW846 8260B
1,2-Dichloroethane	ND	1.0	ug/L	SW846 8260B
1,1-Dichloroethene	ND	1.0	ug/L	SW846 8260B
cis-1,2-Dichloroethene	ND	1.0	ug/L	SW846 8260B
trans-1,2-Dichloroethene	ND	1.0	ug/L	SW846 8260B
1,2-Dichloropropane	ND	1.0	ug/L	SW846 8260B
Ethylbenzene	ND	1.0	ug/L	SW846 8260B
Methylene chloride	ND	2.0	ug/L	SW846 8260B
Naphthalene	ND	1.0	ug/L	SW846 8260B
Tetrachloroethene	ND	1.0	ug/L	SW846 8260B
Toluene	ND	1.0	ug/L	SW846 8260B
1,1,1-Trichloroethane	ND	1.0	ug/L	SW846 8260B
1,1,2-Trichloroethane	ND	1.0	ug/L	SW846 8260B
Trichloroethene	ND	1.0	ug/L	SW846 8260B
Vinyl chloride	ND	1.0	ug/L	SW846 8260B
o-Xylene	ND	1.0	ug/L	SW846 8260B
m-Xylene & p-Xylene	ND	1.0	ug/L	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	102	(70 - 130)
1,2-Dichloroethane-d4	96	(70 - 130)
Toluene-d8	105	(70 - 130)
Dibromofluoromethane	102	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #....: G5J070276
MB Lot-Sample #: G5J190000-302

Work Order #....: HM3AQ1AA

Matrix.....: WATER

Analysis Date...: 10/18/05
Dilution Factor: 1

Prep Date.....: 10/18/05
Prep Batch #....: 5292302

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Benzene	ND	1.0	ug/L	SW846 8260B
Carbon tetrachloride	ND	1.0	ug/L	SW846 8260B
Chloroethane	ND	1.0	ug/L	SW846 8260B
Chloroform	ND	1.0	ug/L	SW846 8260B
1,1-Dichloroethane	ND	1.0	ug/L	SW846 8260B
1,2-Dichloroethane	ND	1.0	ug/L	SW846 8260B
1,1-Dichloroethene	ND	1.0	ug/L	SW846 8260B
cis-1,2-Dichloroethene	ND	1.0	ug/L	SW846 8260B
trans-1,2-Dichloroethene	ND	1.0	ug/L	SW846 8260B
1,2-Dichloropropane	ND	1.0	ug/L	SW846 8260B
Ethylbenzene	ND	1.0	ug/L	SW846 8260B
Methylene chloride	ND	2.0	ug/L	SW846 8260B
Naphthalene	ND	1.0	ug/L	SW846 8260B
Tetrachloroethene	ND	1.0	ug/L	SW846 8260B
Toluene	ND	1.0	ug/L	SW846 8260B
1,1,1-Trichloroethane	ND	1.0	ug/L	SW846 8260B
1,1,2-Trichloroethane	ND	1.0	ug/L	SW846 8260B
Trichloroethene	ND	1.0	ug/L	SW846 8260B
Vinyl chloride	ND	1.0	ug/L	SW846 8260B
o-Xylene	ND	1.0	ug/L	SW846 8260B
m-Xylene & p-Xylene	ND	1.0	ug/L	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	114	(70 - 130)
1,2-Dichloroethane-d4	125	(70 - 130)
Toluene-d8	119	(70 - 130)
Dibromofluoromethane	122	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #....: G5J070276 Work Order #....: HMLJ21AC Matrix.....: WATER
 LCS Lot-Sample#: G5J180000-444
 Prep Date.....: 10/17/05 Analysis Date...: 10/17/05
 Prep Batch #....: 5291444
 Dilution Factor: 1

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>METHOD</u>
Benzene	91	(80 - 120)	SW846 8260B
1,1-Dichloroethene	89	(80 - 120)	SW846 8260B
Toluene	95	(80 - 120)	SW846 8260B
Trichloroethene	88	(80 - 120)	SW846 8260B
Chlorobenzene	99	(80 - 120)	SW846 8260B

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
4-Bromofluorobenzene	107	(70 - 130)
1,2-Dichloroethane-d4	88	(70 - 130)
Toluene-d8	105	(70 - 130)
Dibromofluoromethane	97	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: G5J070276 Work Order #...: HM1J21AC Matrix.....: WATER
 LCS Lot-Sample#: G5J180000-444
 Prep Date.....: 10/17/05 Analysis Date...: 10/17/05
 Prep Batch #...: 5291444
 Dilution Factor: 1

<u>PARAMETER</u>	<u>SPIKE AMOUNT</u>	<u>MEASURED AMOUNT</u>	<u>UNITS</u>	<u>PERCENT RECOVERY</u>	<u>METHOD</u>
Benzene	20.0	18.2	ug/L	91	SW846 8260B
1,1-Dichloroethene	20.0	17.8	ug/L	89	SW846 8260B
Toluene	20.0	18.9	ug/L	95	SW846 8260B
Trichloroethene	20.0	17.7	ug/L	88	SW846 8260B
Chlorobenzene	20.0	19.8	ug/L	99	SW846 8260B

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
4-Bromofluorobenzene	107	(70 - 130)
1,2-Dichloroethane-d4	88	(70 - 130)
Toluene-d8	105	(70 - 130)
Dibromofluoromethane	97	(70 - 130)

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #....: G5J070276 Work Order #....: HM2P71AC-LCS Matrix.....: WATER
 LCS Lot-Sample#: G5J190000-173 HM2P71AD-LCSD
 Prep Date.....: 10/18/05 Analysis Date...: 10/18/05
 Prep Batch #....: 5292173
 Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Benzene	97	(80 - 120)			SW846 8260B
	105	(80 - 120)	7.8	(0-30)	SW846 8260B
1,1-Dichloroethene	89	(80 - 120)			SW846 8260B
	102	(80 - 120)	13	(0-30)	SW846 8260B
Toluene	102	(80 - 120)			SW846 8260B
	108	(80 - 120)	6.3	(0-30)	SW846 8260B
Trichloroethene	93	(80 - 120)			SW846 8260B
	100	(80 - 120)	7.2	(0-30)	SW846 8260B
Chlorobenzene	101	(80 - 120)			SW846 8260B
	110	(80 - 120)	8.2	(0-30)	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	106	(70 - 130)
	109	(70 - 130)
1,2-Dichloroethane-d4	92	(70 - 130)
	93	(70 - 130)
Toluene-d8	109	(70 - 130)
	107	(70 - 130)
Dibromofluoromethane	99	(70 - 130)
	97	(70 - 130)

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #....: G5J070276 Work Order #....: HM2P71AC-LCS Matrix.....: WATER
 LCS Lot-Sample#: G5J190000-173 HM2P71AD-LCSD
 Prep Date.....: 10/18/05 Analysis Date...: 10/18/05
 Prep Batch #....: 5292173
 Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	RPD	METHOD
Benzene	20.0	19.5	ug/L	97		SW846 8260B
	20.0	21.0	ug/L	105	7.8	SW846 8260B
1,1-Dichloroethene	20.0	17.9	ug/L	89		SW846 8260B
	20.0	20.3	ug/L	102	13	SW846 8260B
Toluene	20.0	20.4	ug/L	102		SW846 8260B
	20.0	21.7	ug/L	108	6.3	SW846 8260B
Trichloroethene	20.0	18.7	ug/L	93		SW846 8260B
	20.0	20.1	ug/L	100	7.2	SW846 8260B
Chlorobenzene	20.0	20.3	ug/L	101		SW846 8260B
	20.0	22.0	ug/L	110	8.2	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	106	(70 - 130)
	109	(70 - 130)
1,2-Dichloroethane-d4	92	(70 - 130)
	93	(70 - 130)
Toluene-d8	109	(70 - 130)
	107	(70 - 130)
Dibromofluoromethane	99	(70 - 130)
	97	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #....: G5J070276 Work Order #....: HM3AQ1AC-LCS Matrix.....: WATER
 LCS Lot-Sample#: G5J190000-302 HM3AQ1AD-LCSD
 Prep Date.....: 10/18/05 Analysis Date...: 10/18/05
 Prep Batch #....: 5292302
 Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Benzene	91	(80 - 120)			SW846 8260B
	98	(80 - 120)	7.8	(0-30)	SW846 8260B
1,1-Dichloroethene	80	(80 - 120)			SW846 8260B
	96	(80 - 120)	18	(0-30)	SW846 8260B
Toluene	93	(80 - 120)			SW846 8260B
	101	(80 - 120)	8.6	(0-30)	SW846 8260B
Trichloroethene	90	(80 - 120)			SW846 8260B
	100	(80 - 120)	9.9	(0-30)	SW846 8260B
Chlorobenzene	96	(80 - 120)			SW846 8260B
	100	(80 - 120)	3.6	(0-30)	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	111	(70 - 130)
	116	(70 - 130)
1,2-Dichloroethane-d4	113	(70 - 130)
	117	(70 - 130)
Toluene-d8	117	(70 - 130)
	123	(70 - 130)
Dibromofluoromethane	114	(70 - 130)
	121	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #....: G5J070276 Work Order #....: HM3AQ1AC-LCS Matrix.....: WATER
 LCS Lot-Sample#: G5J190000-302 HM3AQ1AD-LCSD
 Prep Date.....: 10/18/05 Analysis Date...: 10/18/05
 Prep Batch #....: 5292302
 Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	RPD	METHOD
Benzene	20.0	18.1	ug/L	91		SW846 8260B
	20.0	19.6	ug/L	98	7.8	SW846 8260B
1,1-Dichloroethene	20.0	15.9	ug/L	80		SW846 8260B
	20.0	19.1	ug/L	96	18	SW846 8260B
Toluene	20.0	18.5	ug/L	93		SW846 8260B
	20.0	20.2	ug/L	101	8.6	SW846 8260B
Trichloroethene	20.0	18.1	ug/L	90		SW846 8260B
	20.0	19.9	ug/L	100	9.9	SW846 8260B
Chlorobenzene	20.0	19.3	ug/L	96		SW846 8260B
	20.0	20.0	ug/L	100	3.6	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	111	(70 - 130)
	116	(70 - 130)
1,2-Dichloroethane-d4	113	(70 - 130)
	117	(70 - 130)
Toluene-d8	117	(70 - 130)
	123	(70 - 130)
Dibromofluoromethane	114	(70 - 130)
	121	(70 - 130)

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

MATRIX SPIKE SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: G5J070276 Work Order #...: HL9L81AC-MS Matrix.....: WG
 MS Lot-Sample #: G5J070276-007 HL9L81AD-MSD
 Date Sampled...: 10/03/05 Date Received...: 10/06/05
 Prep Date.....: 10/17/05 Analysis Date...: 10/17/05
 Prep Batch #...: 5291444
 Dilution Factor: 10

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Benzene	108	(70 - 130)			SW846 8260B
	110	(70 - 130)	2.0	(0-30)	SW846 8260B
1,1-Dichloroethene	123	(70 - 130)			SW846 8260B
	124	(70 - 130)	1.6	(0-30)	SW846 8260B
Toluene	114	(70 - 130)			SW846 8260B
	116	(70 - 130)	1.5	(0-30)	SW846 8260B
Trichloroethene	103	(70 - 130)			SW846 8260B
	105	(70 - 130)	0.75	(0-30)	SW846 8260B
Chlorobenzene	111	(70 - 130)			SW846 8260B
	113	(70 - 130)	2.2	(0-30)	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	104	(70 - 130)
	111	(70 - 130)
1,2-Dichloroethane-d4	85	(70 - 130)
	90	(70 - 130)
Toluene-d8	101	(70 - 130)
	104	(70 - 130)
Dibromofluoromethane	92	(70 - 130)
	96	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

MATRIX SPIKE SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #....: G5J070276 Work Order #....: HL9L81AC-MS Matrix.....: WG
 MS Lot-Sample #: G5J070276-007 HL9L81AD-MSD
 Date Sampled....: 10/03/05 Date Received...: 10/06/05
 Prep Date.....: 10/17/05 Analysis Date...: 10/17/05
 Prep Batch #....: 5291444
 Dilution Factor: 10

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD
Benzene	ND	200	215	ug/L	108		SW846 8260B
	ND	200	220	ug/L	110	2.0	SW846 8260B
1,1-Dichloroethene	ND	200	245	ug/L	123		SW846 8260B
	ND	200	249	ug/L	124	1.6	SW846 8260B
Toluene	ND	200	228	ug/L	114		SW846 8260B
	ND	200	232	ug/L	116	1.5	SW846 8260B
Trichloroethene	280	200	489	ug/L	103		SW846 8260B
	280	200	493	ug/L	105	0.75	SW846 8260B
Chlorobenzene	ND	200	222	ug/L	111		SW846 8260B
	ND	200	227	ug/L	113	2.2	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	104	(70 - 130)
	111	(70 - 130)
1,2-Dichloroethane-d4	85	(70 - 130)
	90	(70 - 130)
Toluene-d8	101	(70 - 130)
	104	(70 - 130)
Dibromofluoromethane	92	(70 - 130)
	96	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

AUTOMATED DATA REVIEW SUMMARY

Facility: SWMU 58
Event: 2004_2005 SWMU 58 Phase II RFI GW
Contract: 9T9H213C
Sample Delivery Group: G5J070276

Field Contractor: Parsons Engineering Science, Salt Lake City
Laboratory Contractor: SEVERN TRENT LABS., WEST SACRAMENTO, CA
Data Review Contractor: Synectics, Sacramento, CA
Guidance Document: *Final Phase II RCRA Facility Investigation SWMU-58 Workplan, December 2003*

Analytical Method	Normal Samples	Field QC Samples
SW8260B	18	2

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in Final Phase II RCRA Facility Investigation SWMU-58 Workplan, December 2003 to the extent possible. Where definitive guidance is not provided, data has been evaluated in a conservative manner using professional judgment. In cases where two qualifiers are listed as an action, such as "J/UJ", the first qualifier applies to positive results, and the second to non-detect results.

Samples were collected by Parsons Engineering Science, Salt Lake City; analyses were performed by SEVERN TRENT LABS., WEST SACRAMENTO, CA and were reported under sample delivery group (SDG) G5J070276. Results have been evaluated electronically using electronic data deliverables (EDDs) provided by the laboratory. The laboratory data summary forms (hard copy) have been reviewed during this effort and compared to the automated review output. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative. The following quality control elements were evaluated during this review effort:

- Technical Holding Times
- Continuing Calibration Verification
- Method Blank Contamination
- Field Blank Contamination
- Blank Spike Accuracy
- Blank Spike Precision
- Matrix Spike Accuracy
- Matrix Spike Precision
- Surrogate Recovery
- Laboratory Duplicate Precision
- Field Duplicate Precision

A minimum of ten percent of sample and QC results were manually evaluated for compliance with project specific requirements and consistency with hard copy results. The following reports were generated during the evaluation of this data set and are presented as attachments to this report as applicable.

Data Submission Warnings – Warnings encountered during the data submission process are evaluated and their affect on data quality is discussed in the narrative.

Batch – The analytical batch report is reviewed for completeness and compliance with project specific requirements. Incomplete or non-compliant run sequences are identified and their impact on data quality are discussed in the narrative.

QC Outlier – Results exceeding the evaluation criteria are reviewed for compliance with project requirements and a minimum of ten percent of the non-compliant QC values reported electronically are verified for consistency with hard-copy values.

Qualified Results – Qualified results are evaluated for compliance with project requirements and ten percent of qualified results are verified for consistency with the QC Outlier Report.

Field Duplicate – Field duplicate comparison results are evaluated for compliance with project requirements and ten percent of values reported are verified for consistency with the hard-copy data.

Rejected Results – All rejected results are evaluated for compliance with project requirements. The reason for rejection of the data is verified against hard copy data.

Analytical deficiencies, project non-compliance issues and inconsistencies with hard copy results observed during ADR evaluation process and their impact on data quality are summarized in the ADR narrative.

Out of control events experienced by the laboratory have warranted the qualification of 2.6% (11 results) and the rejection of 0 % (0 results) of the data set. These deficiencies are detailed in the referenced attachments, and discussed in the ADR narrative, where appropriate.

Released by

Date

Reason and Comment Codes

<u>Code</u>	<u>Definition</u>
C1	Diluted Out
C2	Flag Parent Only
C2S	Flag Parent (Soil); Batch (Water)
C3	No Action
C4	No QC Outliers
C5	One or both values <5x RL
C6	Recalculated Value
C7	Material Blanks
C8	Spike Insignificant
C9	No Flags; set to ND by method/cal. blank

Reasons

<u>Code</u>	<u>Definition</u>
A	Serial dilution
B	Calibration Blank - Negative
	Negative Blank
B1	Blank
B2	Calibration Blank
C	Continuing Calibration Verification
	Continuing Calibration Verification RRF
D	BS RPD
	Field Duplicate RPD
D1	Lab Replicate RPD
D2	MS RPD
E	Exceeds LinearCalibration Range
F	Hydrocarbon pattern does not match standard
G	Initial Calibration RRF
	Initial Calibration RSD
H	Test Hold Time
	Prep Hold Time
I	Internal standard
K1	Equip Blank
K2	Field Blank
K3	Trip Blank
L	LCS Recovery
M	MS Recovery
N	Blank - No Action
O	Interference check sample
P	Column RPD
Q	Material Blank
S	Surrogate
T	Receipt Temperature
TI	Tentatively Identified Compound
TR	Trace Level Detect
W	Column breakdown (pesticides)
X	Raised reporting limit
Y	Analyte not confirmed on second column

ADR CASE NARRATIVE

Laboratory ID: G5J070276

Prior to loading and processing data, modifications to the project setup may be requested by the laboratory and/or contractor, and approved by the client. These modifications allow the loading of data that was not in complete agreement with the project guidance document; in some cases, variances to the project document may be in process, in others, the changes are required to accept data that had not been generated in compliance with the project guidance document. All project setup modifications are listed below:

There were no project setup modifications associated with this sample delivery group.

Chemistry Data Quality

The data submission process incorporates a series of stored procedures designed to identify conditions in electronic data deliverables (EDD) that would affect chemistry data quality. These conditions will not result in the qualification of the data; however, these findings should be reviewed for possible contractual non-compliance. A brief explanation of each finding encountered for this data set and the potential impact on chemistry data quality is summarized below.

There were no issues affecting chemistry data quality associated with this sample delivery group.

Data Verification

The data verification process includes a manual review of information on the chains of custody and laboratory case narratives, a check of all rejected results and a minimum of 10 percent of sample and QC results for consistency with hard copy reports, and a cursory review of all reports generated during the automated review process. The following comments are associated with the verification process:

1. Volatiles by SW8260

An matrix spike (MS) was not provided on the EDD for the analytical batch for this SDG. No qualifiers have been applied on this basis.

It was noted that the data flagging system could not determine the hold times for the reanalysis of samples C-45FD001, C-45GW002, C-45GW003, C-48FGW001, C-48FGW002, C-48FGW003, and C-48FGW004 due to 2 sets of surrogates being provided for the same samples. The data was manually reviewed and the reanalysis were found to be outside project warning limits. TCE was flagged as estimated as seen in the Qualified Results report.

All of the reports utilized during the data verification process are provided as attachments to this report.

Batch Report

Facility: SWMU 58
 Lab: SVLS
 Filename: G5J070276
 Status: Certified - 12/12/2005
 User: BonnieMcNeill

Test Method: SW8260B
 Leach Method: NONE

<u>Test Batch</u>	<u>Prep Batch</u>	<u>Leach Batch</u>	<u>Location</u>	<u>Matrix</u>	<u>Field Sample ID</u>	<u>Lab Sample ID</u>	<u>Test Date and Time</u>	<u>Sample Type</u>
HP101018	NA	NA	LABQC	WQ		HSL020	10/18/2005 1:56:00PM	CV6
	5292302	NA	LABQC	WQ		G5J190000302	10/18/2005 3:31:00PM	BS1
	5292302	NA	LABQC	WQ		G5J190000302	10/18/2005 4:13:00PM	BD1
	5292302	NA	LABQC	WQ		G5J190000302	10/18/2005 5:14:00PM	LB1
	5292302	NA	D-18	WG	D-18GW009	G5J070276016	10/18/2005 5:48:00PM	N1
	5292302	NA	D-18	WG	D-18GW010	G5J070276017	10/18/2005 6:13:00PM	N1
	5292302	NA	D-18	WG	D-18GW011	G5J070276018	10/18/2005 6:37:00PM	N1
	5292302	NA	D-18	WG	D-18GW012	G5J070276019	10/18/2005 7:02:00PM	N1
HP71014	NA	NA	LABQC	WQ		LCS SS	10/14/2005 5:57:00PM	CV1
	NA	NA	LABQC	WQ		LCS SS	10/14/2005 5:57:00PM	CV3
HP71020	NA	NA	LABQC	WQ		HSL020	10/20/2005 11:23:00AI	CV2
	NA	NA	LABQC	WQ		HSL020	10/20/2005 11:23:00AI	CV7
	5340483	NA	LABQC	WQ		G5L060000483	10/20/2005 11:56:00AI	BS1
	5340483	NA	LABQC	WQ		G5L060000483	10/20/2005 11:56:00AI	BS1
	5340483	NA	LABQC	WQ		G5L060000483	10/20/2005 12:24:00PI	BD1
	5340483	NA	LABQC	WQ		G5L060000483	10/20/2005 12:24:00PI	BD1
	5340483	NA	LABQC	WQ		G5L060000483	10/20/2005 12:52:00PI	LB1
	5340483	NA	LABQC	WQ		G5L060000483	10/20/2005 12:52:00PI	LB1
	5340483	NA	C-45	WG	C-45FD001	G5J070276006	10/20/2005 1:47:00PM	FD1
	5340483	NA	C-45	WG	C-45GW002	G5J070276008	10/20/2005 2:15:00PM	N1
	5340483	NA	C-45	WG	C-45GW003	G5J070276009	10/20/2005 2:43:00PM	N1
	5340483	NA	C-48F	WG	C-48FGW004	G5J070276013	10/20/2005 3:11:00PM	N1
	5340483	NA	C-48F	WG	C-48FGW001	G5J070276010	10/20/2005 3:38:00PM	N1
	5340483	NA	C-48F	WG	C-48FGW002	G5J070276011	10/20/2005 4:06:00PM	N1
	5340483	NA	C-48F	WG	C-48FGW003	G5J070276012	10/20/2005 4:34:00PM	N1
HP91006	NA	NA	LABQC	WQ		LCS/SS	10/6/2005 6:22:00PM	CV1
	NA	NA	LABQC	WQ		LCS/SS	10/6/2005 6:45:00PM	CV2

Batch Report

Facility: SWMU 58
 Lab: SVLS
 Filename: G5J070276
 Status: Certified - 12/12/2005
 User: BonnieMcNeill

Test Method: SW8260B
 Leach Method: NONE

<u>Test Batch</u>	<u>Prep Batch</u>	<u>Leach Batch</u>	<u>Location</u>	<u>Matrix</u>	<u>Field Sample ID</u>	<u>Lab Sample ID</u>	<u>Test Date and Time</u>	<u>Sample Type</u>
HP91017	NA	NA	LABQC	WQ		HSL020	10/17/2005 12:00:00PM	CV4
	5291444	NA	LABQC	WQ		G5J180000444	10/17/2005 12:36:00PM	BS1
	5291444	NA	C-45	WG	C-45GW001	G5J070276007	10/17/2005 2:49:00PM	MS1
	5291444	NA	C-45	WG	C-45GW001	G5J070276007	10/17/2005 3:12:00PM	SD1
	5291444	NA	LABQC	WQ		G5J180000444	10/17/2005 3:58:00PM	LB1
	5291444	NA	C-45	WG	C-45GW001	G5J070276007	10/17/2005 4:20:00PM	N1
	5291444	NA	C-45	WG	C-45FD001	G5J070276006	10/17/2005 4:43:00PM	FD1
	5291444	NA	C-45	WG	C-45GW002	G5J070276008	10/17/2005 5:06:00PM	N1
	5291444	NA	C-45	WG	C-45GW003	G5J070276009	10/17/2005 5:29:00PM	N1
	5291444	NA	FIELDQC	WQ	PARSTB12	G5J070276020	10/17/2005 5:52:00PM	TB1
	5340483	NA	C-45	WG	C-45FD001	G5J070276006	10/20/2005 1:47:00PM	FD1
	5340483	NA	C-45	WG	C-45GW002	G5J070276008	10/20/2005 2:15:00PM	N1
	5340483	NA	C-45	WG	C-45GW003	G5J070276009	10/20/2005 2:43:00PM	N1
HP91018	NA	NA	LABQC	WQ		HSL020	10/18/2005 10:46:00AM	CV5
	5292173	NA	LABQC	WQ		G5J190000173	10/18/2005 11:20:00AM	BS1
	5292173	NA	LABQC	WQ		G5J190000173	10/18/2005 11:57:00AM	BD1
	5292173	NA	LABQC	WQ		G5J190000173	10/18/2005 12:43:00PM	LB1
	5292173	NA	D-19	WG	D-19FD001	G5J070276001	10/18/2005 4:46:00PM	N1
	5292173	NA	D-19	WG	D-19GW001	G5J070276002	10/18/2005 5:09:00PM	N1
	5292173	NA	D-19	WG	D-19GW002	G5J070276003	10/18/2005 5:32:00PM	N1
	5292173	NA	D-19	WG	D-19GW003	G5J070276004	10/18/2005 5:55:00PM	N1
	5292173	NA	D-17	WG	D-17GW001	G5J070276005	10/18/2005 6:18:00PM	N1
	5292173	NA	C-48F	WG	C-48FGW001	G5J070276010	10/18/2005 6:41:00PM	N1
	5292173	NA	C-48F	WG	C-48FGW002	G5J070276011	10/18/2005 7:03:00PM	N1
	5292173	NA	C-48F	WG	C-48FGW003	G5J070276012	10/18/2005 7:27:00PM	N1
	5292173	NA	C-48F	WG	C-48FGW004	G5J070276013	10/18/2005 7:49:00PM	N1
	5292173	NA	D-18	WG	D-18GW007	G5J070276014	10/18/2005 8:12:00PM	N1

Batch Report

Facility: SWMU 58
Lab: SVLS
Filename: G5J070276
Status: Certified - 12/12/2005
User: BonnieMcNeill

Test Method: SW8260B
Leach Method: NONE

<u>Test Batch</u>	<u>Prep Batch</u>	<u>Leach Batch</u>	<u>Location</u>	<u>Matrix</u>	<u>Field Sample ID</u>	<u>Lab Sample ID</u>	<u>Test Date and Time</u>	<u>Sample Type</u>
HP91018	5292173	NA	D-18	WG	D-18GW008	G5J070276015	10/18/2005 8:35:00PM	N1
	5340483	NA	C-48F	WG	C-48FGW004	G5J070276013	10/20/2005 3:11:00PM	N1
	5340483	NA	C-48F	WG	C-48FGW001	G5J070276010	10/20/2005 3:38:00PM	N1
	5340483	NA	C-48F	WG	C-48FGW002	G5J070276011	10/20/2005 4:06:00PM	N1
	5340483	NA	C-48F	WG	C-48FGW003	G5J070276012	10/20/2005 4:34:00PM	N1

QC Outliers

Facility: SWMU 58
Event: 2004_2005 SWMU 58 Phase II RFI GW
Reference: 9T9H213C

SDG G5J070276

<u>Test/Leach</u>	<u>QCElement</u>	<u>Sample</u>	<u>Type</u>	<u>Dil'n</u>	<u>Analyte</u>	<u>Result</u>	<u>Units</u>	Warning	Control	<u>Qualifier</u>	<u>Reason</u>	<u>Cmnt.</u>
								<u>Limits</u>	<u>Limits</u>			
SW8260B/NONE	Fld. RPD	C-45FD001	FD1	10.00	Trichloroethene (TCE)	38	RPD	<25	< 25	None	D	C2
SW8260B/NONE	LCS %R	P5292302LABQC	BS1	1.00	1,1-Dichloroethene	80	%	80 - 120	10 - 120	J / UJ	L	

Detected Results

Facility: SWMU 58
 Event: 2004_2005 SWMU 58 Phase II RFI GW
 Reference: ISSS-539-01

SDG: G5J070276

Volatile Organic Compounds by Capillary GC/MS

Test/Leach	Matrix	Field Sample ID	Type	Analyte	RL	Lab Result	Qualified Result	Units	Reason
SW8260B/NONE	WG	C-45FD001	FD	Carbon Tetrachloride	1.0	3.4	3.4	UG/L	
SW8260B/NONE	WG	C-45FD001	FD	Chloroform	1.0	0.32 J	0.32 J	UG/L	TR
SW8260B/NONE	WG	C-45FD001	FD	Trichloroethene (TCE)	10	190	190 J	UG/L	H
SW8260B/NONE	WG	C-45GW001	N	Carbon Tetrachloride	10	3.4 J	3.4 J	UG/L	TR
SW8260B/NONE	WG	C-45GW001	N	Trichloroethene (TCE)	10	280	280	UG/L	
SW8260B/NONE	WG	C-45GW002	N	Carbon Tetrachloride	1.0	3.2	3.2	UG/L	
SW8260B/NONE	WG	C-45GW002	N	Chloroform	1.0	0.35 J	0.35 J	UG/L	TR
SW8260B/NONE	WG	C-45GW002	N	Trichloroethene (TCE)	10	200	200 J	UG/L	H
SW8260B/NONE	WG	C-45GW003	N	Carbon Tetrachloride	1.0	3.0	3.0	UG/L	
SW8260B/NONE	WG	C-45GW003	N	Chloroform	1.0	0.29 J	0.29 J	UG/L	TR
SW8260B/NONE	WG	C-45GW003	N	Trichloroethene (TCE)	10	180	180 J	UG/L	H
SW8260B/NONE	WG	C-48FGW001	N	1,1-Dichloroethene	1.0	1.2	1.2	UG/L	
SW8260B/NONE	WG	C-48FGW001	N	Carbon Tetrachloride	1.0	0.39 J	0.39 J	UG/L	TR
SW8260B/NONE	WG	C-48FGW001	N	Chloroform	1.0	0.63 J	0.63 J	UG/L	TR
SW8260B/NONE	WG	C-48FGW001	N	cis-1,2-Dichloroethylene	1.0	0.10 J	0.10 J	UG/L	TR
SW8260B/NONE	WG	C-48FGW001	N	Trichloroethene (TCE)	20	360	360 J	UG/L	H
SW8260B/NONE	WG	C-48FGW002	N	1,1-Dichloroethene	1.0	1.1	1.1	UG/L	
SW8260B/NONE	WG	C-48FGW002	N	Carbon Tetrachloride	1.0	0.44 J	0.44 J	UG/L	TR
SW8260B/NONE	WG	C-48FGW002	N	Chloroform	1.0	0.48 J	0.48 J	UG/L	TR
SW8260B/NONE	WG	C-48FGW002	N	Trichloroethene (TCE)	20	340	340 J	UG/L	H
SW8260B/NONE	WG	C-48FGW003	N	1,1-Dichloroethene	1.0	1.1	1.1	UG/L	
SW8260B/NONE	WG	C-48FGW003	N	Carbon Tetrachloride	1.0	0.33 J	0.33 J	UG/L	TR
SW8260B/NONE	WG	C-48FGW003	N	Chloroform	1.0	0.50 J	0.50 J	UG/L	TR
SW8260B/NONE	WG	C-48FGW003	N	cis-1,2-Dichloroethylene	1.0	0.12 J	0.12 J	UG/L	TR
SW8260B/NONE	WG	C-48FGW003	N	Trichloroethene (TCE)	20	320	320 J	UG/L	H
SW8260B/NONE	WG	C-48FGW004	N	1,1-Dichloroethane	1.0	0.13 J	0.13 J	UG/L	TR
SW8260B/NONE	WG	C-48FGW004	N	1,1-Dichloroethene	1.0	1.2	1.2	UG/L	

Volatile Organic Compounds by Capillary GC/MS

<u>Test/Leach</u>	<u>Matrix</u>	<u>Field Sample ID</u>	<u>Type</u>	<u>Analyte</u>	<u>RL</u>	<u>Lab Result</u>	<u>Qualified Result</u>	<u>Units</u>	<u>Reason</u>
SW8260B/NONE	WG	C-48FGW004	N	Carbon Tetrachloride	1.0	0.36 J	0.36 J	UG/L	TR
SW8260B/NONE	WG	C-48FGW004	N	Chloroform	1.0	0.56 J	0.56 J	UG/L	TR
SW8260B/NONE	WG	C-48FGW004	N	cis-1,2-Dichloroethylene	1.0	0.18 J	0.18 J	UG/L	TR
SW8260B/NONE	WG	C-48FGW004	N	Trichloroethene (TCE)	10	300	300 J	UG/L	H
SW8260B/NONE	WG	D-17GW001	N	Carbon Tetrachloride	1.0	0.43 J	0.43 J	UG/L	TR
SW8260B/NONE	WG	D-17GW001	N	Chloroform	1.0	0.18 J	0.18 J	UG/L	TR
SW8260B/NONE	WG	D-17GW001	N	Trichloroethene (TCE)	1.0	3.8	3.8	UG/L	
SW8260B/NONE	WG	D-18GW007	N	Trichloroethene (TCE)	1.0	5.0	5.0	UG/L	
SW8260B/NONE	WG	D-18GW008	N	Trichloroethene (TCE)	1.0	4.4	4.4	UG/L	
SW8260B/NONE	WG	D-18GW009	N	Carbon Tetrachloride	1.0	0.15 J	0.15 J	UG/L	TR
SW8260B/NONE	WG	D-18GW009	N	Trichloroethene (TCE)	1.0	3.9	3.9	UG/L	
SW8260B/NONE	WG	D-18GW010	N	Trichloroethene (TCE)	1.0	3.7	3.7	UG/L	
SW8260B/NONE	WG	D-18GW011	N	Carbon Tetrachloride	1.0	0.16 J	0.16 J	UG/L	TR
SW8260B/NONE	WG	D-18GW011	N	Trichloroethene (TCE)	1.0	3.8	3.8	UG/L	
SW8260B/NONE	WG	D-18GW012	N	Trichloroethene (TCE)	1.0	3.8	3.8	UG/L	
SW8260B/NONE	WG	D-19FD001	N	Carbon Tetrachloride	1.0	0.66 J	0.66 J	UG/L	TR
SW8260B/NONE	WG	D-19FD001	N	Chloroform	1.0	0.22 J	0.22 J	UG/L	TR
SW8260B/NONE	WG	D-19FD001	N	Trichloroethene (TCE)	1.0	5.9	5.9	UG/L	
SW8260B/NONE	WG	D-19GW001	N	Carbon Tetrachloride	1.0	0.57 J	0.57 J	UG/L	TR
SW8260B/NONE	WG	D-19GW001	N	Chloroform	1.0	0.25 J	0.25 J	UG/L	TR
SW8260B/NONE	WG	D-19GW001	N	Trichloroethene (TCE)	1.0	6.0	6.0	UG/L	
SW8260B/NONE	WG	D-19GW002	N	Carbon Tetrachloride	1.0	0.76 J	0.76 J	UG/L	TR
SW8260B/NONE	WG	D-19GW002	N	Chloroform	1.0	0.20 J	0.20 J	UG/L	TR
SW8260B/NONE	WG	D-19GW002	N	Trichloroethene (TCE)	1.0	6.3	6.3	UG/L	
SW8260B/NONE	WG	D-19GW003	N	Carbon Tetrachloride	1.0	0.73 J	0.73 J	UG/L	TR
SW8260B/NONE	WG	D-19GW003	N	Chloroform	1.0	0.23 J	0.23 J	UG/L	TR
SW8260B/NONE	WG	D-19GW003	N	Trichloroethene (TCE)	1.0	6.6	6.6	UG/L	

Qualified Results

Facility: SWMU 58
 Event: 2004_2005 SWMU 58 Phase II RFI GW
 Reference: ISSS-539-01

SDG: G5J070276

Volatile Organic Compounds by Capillary GC/MS

Test/Leach	Matrix	Field Sample ID	Type	Analyte	RL	Lab Result	Qualified Result	Units	Reason
SW8260B/NONE	WG	C-45FD001	FD	Chloroform	1.0	0.32 J	0.32 J	UG/L	TR
SW8260B/NONE	WG	C-45FD001	FD	Trichloroethene (TCE)	10	190	190 J	UG/L	H
SW8260B/NONE	WG	C-45GW001	N	Carbon Tetrachloride	10	3.4 J	3.4 J	UG/L	TR
SW8260B/NONE	WG	C-45GW002	N	Chloroform	1.0	0.35 J	0.35 J	UG/L	TR
SW8260B/NONE	WG	C-45GW002	N	Trichloroethene (TCE)	10	200	200 J	UG/L	H
SW8260B/NONE	WG	C-45GW003	N	Chloroform	1.0	0.29 J	0.29 J	UG/L	TR
SW8260B/NONE	WG	C-45GW003	N	Trichloroethene (TCE)	10	180	180 J	UG/L	H
SW8260B/NONE	WG	C-48FGW001	N	Carbon Tetrachloride	1.0	0.39 J	0.39 J	UG/L	TR
SW8260B/NONE	WG	C-48FGW001	N	Chloroform	1.0	0.63 J	0.63 J	UG/L	TR
SW8260B/NONE	WG	C-48FGW001	N	cis-1,2-Dichloroethylene	1.0	0.10 J	0.10 J	UG/L	TR
SW8260B/NONE	WG	C-48FGW001	N	Trichloroethene (TCE)	20	360	360 J	UG/L	H
SW8260B/NONE	WG	C-48FGW002	N	Carbon Tetrachloride	1.0	0.44 J	0.44 J	UG/L	TR
SW8260B/NONE	WG	C-48FGW002	N	Chloroform	1.0	0.48 J	0.48 J	UG/L	TR
SW8260B/NONE	WG	C-48FGW002	N	Trichloroethene (TCE)	20	340	340 J	UG/L	H
SW8260B/NONE	WG	C-48FGW003	N	Carbon Tetrachloride	1.0	0.33 J	0.33 J	UG/L	TR
SW8260B/NONE	WG	C-48FGW003	N	Chloroform	1.0	0.50 J	0.50 J	UG/L	TR
SW8260B/NONE	WG	C-48FGW003	N	cis-1,2-Dichloroethylene	1.0	0.12 J	0.12 J	UG/L	TR
SW8260B/NONE	WG	C-48FGW003	N	Trichloroethene (TCE)	20	320	320 J	UG/L	H
SW8260B/NONE	WG	C-48FGW004	N	1,1-Dichloroethane	1.0	0.13 J	0.13 J	UG/L	TR
SW8260B/NONE	WG	C-48FGW004	N	Carbon Tetrachloride	1.0	0.36 J	0.36 J	UG/L	TR
SW8260B/NONE	WG	C-48FGW004	N	Chloroform	1.0	0.56 J	0.56 J	UG/L	TR
SW8260B/NONE	WG	C-48FGW004	N	cis-1,2-Dichloroethylene	1.0	0.18 J	0.18 J	UG/L	TR
SW8260B/NONE	WG	C-48FGW004	N	Trichloroethene (TCE)	10	300	300 J	UG/L	H
SW8260B/NONE	WG	D-17GW001	N	Carbon Tetrachloride	1.0	0.43 J	0.43 J	UG/L	TR
SW8260B/NONE	WG	D-17GW001	N	Chloroform	1.0	0.18 J	0.18 J	UG/L	TR
SW8260B/NONE	WG	D-18GW009	N	1,1-Dichloroethene	1.0	1.0 U	1.0 UJ	UG/L	L
SW8260B/NONE	WG	D-18GW009	N	Carbon Tetrachloride	1.0	0.15 J	0.15 J	UG/L	TR

SDG: G5J070276

Volatile Organic Compounds by Capillary GC/MS

<u>Test/Leach</u>	<u>Matrix</u>	<u>Field Sample ID</u>	<u>Type</u>	<u>Analyte</u>	<u>RL</u>	<u>Lab Result</u>	<u>Qualified Result</u>	<u>Units</u>	<u>Reason</u>
SW8260B/NONE	WG	D-18GW010	N	1,1-Dichloroethene	1.0	1.0 U	1.0 UJ	UG/L	L
SW8260B/NONE	WG	D-18GW011	N	1,1-Dichloroethene	1.0	1.0 U	1.0 UJ	UG/L	L
SW8260B/NONE	WG	D-18GW011	N	Carbon Tetrachloride	1.0	0.16 J	0.16 J	UG/L	TR
SW8260B/NONE	WG	D-18GW012	N	1,1-Dichloroethene	1.0	1.0 U	1.0 UJ	UG/L	L
SW8260B/NONE	WG	D-19FD001	N	Carbon Tetrachloride	1.0	0.66 J	0.66 J	UG/L	TR
SW8260B/NONE	WG	D-19FD001	N	Chloroform	1.0	0.22 J	0.22 J	UG/L	TR
SW8260B/NONE	WG	D-19GW001	N	Carbon Tetrachloride	1.0	0.57 J	0.57 J	UG/L	TR
SW8260B/NONE	WG	D-19GW001	N	Chloroform	1.0	0.25 J	0.25 J	UG/L	TR
SW8260B/NONE	WG	D-19GW002	N	Carbon Tetrachloride	1.0	0.76 J	0.76 J	UG/L	TR
SW8260B/NONE	WG	D-19GW002	N	Chloroform	1.0	0.20 J	0.20 J	UG/L	TR
SW8260B/NONE	WG	D-19GW003	N	Carbon Tetrachloride	1.0	0.73 J	0.73 J	UG/L	TR
SW8260B/NONE	WG	D-19GW003	N	Chloroform	1.0	0.23 J	0.23 J	UG/L	TR

DATA MANAGEMENT NARRATIVE

Laboratory ID: G5J070276

Data Submission

The data submission process incorporates a series of stored procedures designed to identify valid value (VVL), logical (LE), and project specific errors (PSE) in electronic data deliverables (EDD). Automated data review (ADR) is most efficient when data generators correct all errors. Dependent primarily upon the electronic reporting capabilities of the data generator, the severity of the logical and project specific errors listed below have been reduced to warnings. A warning log is generated with each data submission and is presented as an attachment to this report. A brief explanation of each error encountered for this data set and the potential impact on data quality is summarized below.

1. Logical Error (LE) spLE01_ANADATE_Unique

This logical error occurs when multiple analyses are submitted within the same analytical batch that have identical analysis dates and times. This occurs in the laboratory when instruments are able to perform analyses in less than one minute, as ERPIMS specification records time only to the minute. However, it can also occur if the time of analysis is not recorded by an instrument, and the laboratory analyst reports all measurements in a batch with the same time. Whenever possible, actual times of analysis should be recorded and reported.

2. Project Specific Error (PSE) spPSE01L_Invalid_Units_QC

This PSE occurs when laboratory quality control samples are reported with units of percent as opposed to true values. This inconsistency does not affect data quality, unless the submittal is scheduled for delivery to the AFCEE in accordance with the ERPIMS 4.0 specification. Automated data review can be performed for laboratory QC when units are reported in percent or in concentration units. However, to avoid this warning on future submittals, the laboratory would need to report these values in units of concentration (i.e., ug/L).

3. Logical Error (LE) spLE01_QAPPFLAGS_F

This LE warning occurs when there are positive results less than the RL and associated QAPPFLAGS are not "F". This requirement is only necessary if the project is an AFCEE project or if the data is to be submitted to ERPIMS. To avoid this warning in the future, apply QAPPFLAGS of "F" whenever the detected result is less than the RL.

4. Valid Value List (VVL) spVVL32_LABLOTCTL

This warning occurs when the laboratory does not include the preparation batch number (LABLOTCTL). The LABLOTCTL field should be populated with the same ID for all field and QC samples extracted/prepared in the same batch. To avoid this warning on future submittals, populate the LABLOTCTL field.

5. Valid Value List (VVL) spVVL33_CALREFID

This valid value warning occurs when the laboratory does not include the calibration reference ID (CALREFID). To avoid this warning in the future, the laboratory should include the CALREFID on the electronic data.

6. Valid Value List (VVL) spVVL56_QAPPFLAGS

This valid value warning occurs when there are QAPPFLAGS in the file that are not official AFCEE qualifiers. Using the official AFCEE qualifiers is necessary only if the project is an AFCEE project or if the data is to be submitted to ERPIMS. To avoid this warning in the future, apply only AFCEE qualifiers to the QAPPFLAGS field.

A detailed description of the stored procedures utilized during the data submission process is provided as an attachment to this report (Submission Warnings).

Submission Warnings

Facility: SWMU 58
Data Generator: SVLS
File Name: N:\Temp Data\Parsons\Tooelle\G5J070276\G5J070276.txt

LE

<u>Query Name</u>	<u>Finding</u>	<u>Record Count</u>
spLE01_ANADATE_Unique	ANMCODE is SW8260B; ANADATE is Oct 20 2005 11:23AM; ANALOT is HP71020	2
	ANMCODE is SW8260B; ANADATE is Oct 14 2005 5:57PM; ANALOT is HP71014	2

PSE

<u>Query Name</u>	<u>Finding</u>	<u>Record Count</u>
spPSE01L_Invalid_Units_QC	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is N/STD; UNITS is percent	87
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is BD/STD; UNITS is percent	9
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is MS/STD; UNITS is percent	3
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is FD/STD; UNITS is percent	12
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is SD/STD; UNITS is percent	3
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is CV/ORG; UNITS is PERCENT	106
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is CV/STD; UNITS is percent	27
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is BS/STD; UNITS is percent	12
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is TB/STD; UNITS is percent	3
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is LB/STD; UNITS is percent	12

VVL

<u>Query Name</u>	<u>Finding</u>	<u>Record Count</u>
spLE01_QAPPFLAGS_F	PARVQ is TR; PARVAL is 0.3300; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 3.4000; RL is 10.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.1200; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.5600; RL is 1.0000; QAPPFLAGS is J	1

Submission Warnings

Facility: SWMU 58
Data Generator: SVLS
File Name: N:\Temp Data\Parsons\Tooelle\G5J070276\G5J070276.txt

VVL

<u>Query Name</u>	<u>Finding</u>	<u>Record Count</u>
spLE01_QAPPFLAGS_F	PARVQ is TR; PARVAL is 0.1500; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.3500; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.3900; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.2300; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.7600; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.2900; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.6600; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.3200; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.4300; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.7300; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.2500; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.1300; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.5000; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.1600; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.5700; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.6300; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.3600; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.1000; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.4800; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.2000; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.2200; RL is 1.0000; QAPPFLAGS is J	1

Submission Warnings

Facility: SWMU 58
Data Generator: SVLS
File Name: N:\Temp Data\Parsons\Tooelle\G5J070276\G5J070276.txt

VVL

<u>Query Name</u>	<u>Finding</u>	<u>Record Count</u>
spLE01_QAPPFLAGS_F	PARVQ is TR; PARVAL is 0.1800; RL is 1.0000; QAPPFLAGS is J	2
	PARVQ is TR; PARVAL is 0.4400; RL is 1.0000; QAPPFLAGS is J	1
spVVL32_LABLOTCTL	LABLOTCTL is Null	133
spVVL33_CALREFID	CALREFID is Null	655
spVVL56_QAPPFLAGS	QAPPFLAGS is Uq	1

Total Record Count: 788
Error Count: 0
Warning Count: 1,103



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October 30, 2005

STL SACRAMENTO PROJECT NUMBER: G5J130382
PO/CONTRACT: 744139-30012

Jan Barbas
Parsons
406 West South Jordan Parkway
Suite 300
South Jordan, UT 84095

Dear Mr. Barbas,

This report contains the analytical results for the samples received under chain of custody by STL Sacramento on October 13, 2005. These samples are associated with your Tooele project.

The test results in this report meet all NELAC requirements for parameters that accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The case narrative is an integral part of this report.

If you have any questions, please feel free to call me at (916) 374-4427.

Sincerely,

A handwritten signature in black ink, appearing to read "Nilo Ligi".

Nilo Ligi
Project Manager

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CASE NARRATIVE

STL SACRAMENTO PROJECT NUMBER G5J130382

General Comments

Samples were received at 2 degrees C.

Sample(s): 1 - 12

#1 anion bottle labeled at 1044, COC lists 1037.

#2 anion bottle labeled at 1101,1109,1118, COC lists 1055,1105,1113.

#3 anion bottle labeled at 1144, COC lists 1138.

#4 anion bottle labeled at 1156, COC lists 1151.

#5 anion bottle labeled at 1215, COC lists 1209.

#6 anion bottle labeled at 1229, COC lists 1223.

#7 anion bottle labeled at 1247, COC lists 1240.

Only the metals bottles match the COC.

WATER, 8260B, Volatile Organics

The samples were analysed for Volatile Organics by Method 8260B(GC-MS). Sample was prepared by Purge and Trap. Detection is achieved by gas chromatography – Mass Spectrometry. All QC criteria were met.

WATER, 6010B, Cations (Ca,Mg,K,Na)

The samples were analysed for Metals by Method 6010B (ICP) following extraction. Detection is achieved by Inductively Coupled Plasma –Atomic Emission Spectrometry.

WATER, 300.0A, Anions

The samples were analysed for Anions by Method 300.0 (IC). All QC criteria were met.

There were no other anomalies associated with this project.

STL Sacramento Certifications/Accreditations

Certifying State	Certificate #	Certifying State	Certificate #
Alaska	UST-055	Oregon*	CA 200005
Arizona	170616	Pennsylvania	68-1272
Arkansas	04-067-0	South Carolina	87014002
California	0111904	Texas	08-27032002A
Colorado	NA	Utah*	QUANI
Connecticut	1211669	Virginia	001178
Florida*	E87570	Washington	C087
Georgia	960	West Virginia	92368354
Hawaii	NA	Wisconsin	998204680
Idaho	00944	WTSC	NA
Michigan	9947	USACE	NA
Minnesota	CA-4	USDA Foreign Plant	3-82605
New Jersey*	CA005	USDA Foreign Soil	S-46613
New York	11666		

*NELAP accredited. A more detailed parameter list is available upon request. Update 1/27/05

QC Parameter Definitions

QC Batch: The QC batch consists of a set of up to 20 field samples that behave similarly (i.e., same matrix) and are processed using the same procedures, reagents, and standards at the same time.

Method Blank: An analytical control consisting of all reagents, which may include internal standards and surrogates, and is carried through the entire analytical procedure. The method blank is used to define the level of laboratory background contamination.

Laboratory Control Sample and Laboratory Control Sample Duplicate (LCS/LCSD): An aliquot of blank matrix spiked with known amounts of representative target analytes. The LCS (and LCSD, as required) is carried through the entire analytical process and is used to monitor the accuracy of the analytical process independent of potential matrix effects. If an LCSD is performed, it may also be used to evaluate the precision of the process.

Duplicate Sample (DU): Different aliquots of the same sample are analyzed to evaluate the precision of an analysis.

Surrogates: Organic compounds not expected to be detected in field samples, which behave similarly to target analytes. These are added to every sample within a batch at a known concentration to determine the efficiency of the sample preparation and analytical process.

Matrix Spike and Matrix Spike Duplicate (MS/MSD): An MS is an aliquot of a matrix fortified with known quantities of specific compounds and subjected to an entire analytical procedure in order to indicate the appropriateness of the method for a particular matrix. The percent recovery for the respective compound(s) is then calculated. The MSD is a second aliquot of the same matrix as the matrix spike, also spiked, in order to determine the precision of the method.

Isotope Dilution: For isotope dilution methods, isotopically labeled analogs (internal standards) of the native target analytes are spiked into the sample at time of extraction. These internal standards are used for quantitation, and monitor and correct for matrix effects. Since matrix effects on method performance can be judged by the recovery of these analogs, there is little added benefit of performing MS/MSD for these methods. MS/MSD are only performed for client or QAPP requirements.

Control Limits: The reported control limits are either based on laboratory historical data, method requirements, or project data quality objectives. The control limits represent the estimated uncertainty of the test results.

Sample Summary G5J130382

<u>WO#</u>	<u>Sample #</u>	<u>Client Sample ID</u>	<u>Sampling Date</u>	<u>Received Date</u>
HMN2H 1		D-18FD001	10/11/2005 10:37 AM	10/13/2005 09:30 AM
HMN2K 2		D-18GW001	10/11/2005 10:55 AM	10/13/2005 09:30 AM
HMN2M 3		D-18GW002	10/11/2005 11:38 AM	10/13/2005 09:30 AM
HMN2V 4		D-18GW003	10/11/2005 11:51 AM	10/13/2005 09:30 AM
HMN2W 5		D-18GW004	10/11/2005 12:09 PM	10/13/2005 09:30 AM
HMN2X 6		D-18GW005	10/11/2005 12:23 PM	10/13/2005 09:30 AM
HMN20 7		D-18GW006	10/11/2005 12:40 PM	10/13/2005 09:30 AM
HMN21 8		C-47FGW001	10/11/2005 03:15 PM	10/13/2005 09:30 AM
HMN22 9		C-47FGW002	10/11/2005 03:19 PM	10/13/2005 09:30 AM
HMN23 10		C-47FGW003	10/11/2005 03:23 PM	10/13/2005 09:30 AM
HMN24 11		C-47FGW004	10/11/2005 03:28 PM	10/13/2005 09:30 AM
HMN25 12		PARSTB14	10/11/2005 08:00 AM	10/13/2005 09:30 AM

Notes(s):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity, pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight

SAMPLE RECEIPT RECORDS

CHAIN OF CUSTODY

PARSONS

COC ID: 1000

Project Name: Tooele Industrial Area Contractor: Parsons-SLC

Project Manager: Ed Staes Installation: TEAD

Sample Coordinator: Kurt Alloway Sample Program:

Parsons Point of Contact: Jan Barbas
 406 W. South Jordan Parkway
 Suite 300
 South Jordan, Utah 84095
 (801) 572-5999 FAX (801) 572-9069

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
D-18	D-18	D-18FD001	WG	KB	FD	1	10/11/05	1037	JND	155'	-	2

Analysis	Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot
ALKALINITY	SVLS	-	-			
ANIONS	SVLS	1	1			
CATIONS	SVLS	1	1			

Remarks:

*1 labeled @ 1044

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
D-18	D-18	D-18GW001	WG	KB	N	1	10/11/05	1055	JND	155'	-	2

Analysis	Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot
ALKALINITY	SVLS	-	-			
ANIONS	SVLS	1	1			
CATIONS	SVLS	1	1			

Remarks:

*1 labeled @ 1101

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
D-18	D-18	D-18MS001	WG	KB	MS	1	10/11/05	1105	JND	155'	-	2

Analysis	Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot
ALKALINITY	SVLS	-	-			
ANIONS	SVLS	1	1			
CATIONS	SVLS	1	1			

Remarks:

*1 labeled @ 1109

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
D-18	D-18	D-18SD001	WG	KB	SD	1	10/11/05	1113	JND	155'	-	2

Analysis	Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot
ALKALINITY	SVLS	-	-			
ANIONS	SVLS	1	1			
CATIONS	SVLS	1	1			

Remarks:

*1 labeled @ 1118

0010-1305

RECEIVED IN GOOD CONDITION
 UNDER COC

OCT 13 2005

INI:

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
<i>[Signature]</i>	10/11/05 1545	<i>[Signature]</i>	10/11/05 1545
<i>[Signature]</i> To: FedEx	10/12/05 1630	<i>[Signature]</i>	10-13-05 1500

To: STL Laboratories, 880 Riverside Pkwy, W. Sacramento, CA, 95605 (916) 373-5600

Friday, September 16, 2005

Page 1 of 1

CHAIN OF CUSTODY

PARSONS

COC ID: 1003

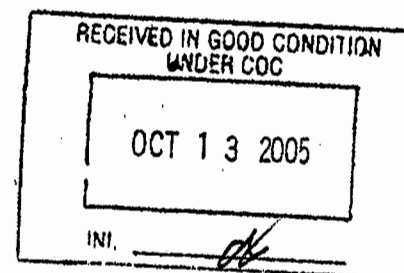
Project Name: Tooele Industrial Area Contractor: Parsons-SLC

Project Manager: Ed Staes Installation: TEAD

Sample Coordinator: Kurt Alloway Sample Program:

Parsons Point of Contact: Jan Barbas
406 W. South Jordan Parkway
Suite 300
South Jordan, Utah 84095
(801) 572-5999 FAX (801) 572-9069

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Cnts.
D-18	D-18	D-18GW002	WG	KB	N	1	10/11/05	1138	gnd	165'	-	2
Analysis		Lab	Cooler	No. Cnts	AB Lot	EB Lot	TB Lot	Remarks:				
ALKALINITY		SVLS		-				* labeled @ 1144				
ANIONS		SVLS		1								
CATIONS		SVLS		1								



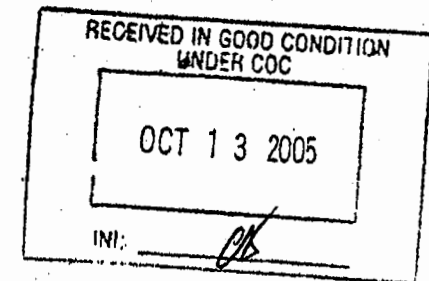
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Jeff Starnes	10/11/05 1545	Jeff Starnes	10/11/05 1545
FAO Ex	10/12/05 1630	Kurt Alloway	10-13-05 1500

To: STL Laboratories, 880 Riverside Pkwy, W. Sacramento, CA, 95805 (916) 373-5600

Friday, September 16, 2005

Page 1 of 1

CHAIN OF CUSTODY PARSONS COC ID: 1004		Project Name: Tooele Industrial Area		Contractor: Parsons-SLC		Parsons Point of Contact: Jan Barbas 406 W. South Jordan Parkway Suite 300 South Jordan, Utah 84095 (801) 572-5999 FAX (801) 572-9069						
		Project Manager: Ed Staes		Installation: TEAD								
		Sample Coordinator: Kurt Alloway		Sample Program:								
Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
D-18	D-18	D-18GW003	WG	KB	N	1	10/11/05	1151	JND	175'	-	2
Analysis		Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot	Remarks: <i>* labul @ 1150</i>				
ALKALINITY		SVLS		-								
* ANIONS		SVLS		1								
CATIONS		SVLS		1								



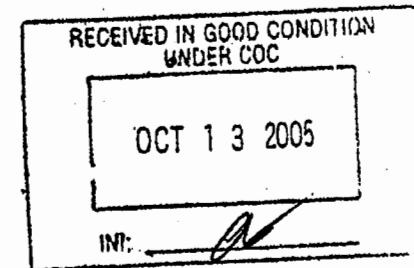
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<i>[Signature] To: Fed Ex</i>	10/12/05 1630	<i>[Signature]</i>	10-12-05 1500

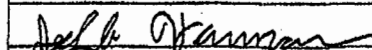
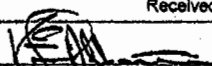
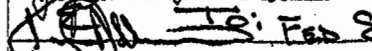
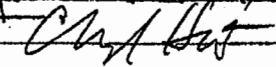
To: STL Laboratories, 880 Riverside Pkwy, W. Sacramento, CA, 95605 (916) 373-5600

Friday, September 16, 2005

Page 1 of 1

CHAIN OF CUSTODY PARSONS COC ID: 1005		Project Name: Tooele Industrial Area		Contractor: Parsons-SLC		Parsons Point of Contact: Jan Barbas 406 W. South Jordan Parkway Suite 300 South Jordan, Utah 84095 (801) 572-5999 FAX (801) 572-9069						
		Project Manager: Ed Staes		Installation: TEAD								
		Sample Coordinator: Kurt Alloway		Sample Program:								
Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
D-18	D-18	D-18GW004	WG	KB	N	1	10/11/05	1209	gdt	180'	-	2
Analysis		Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot	Remarks: *126 ucl @ 1215				
ALKALINITY		SVLS		-								
ANIONS		SVLS		1								
CATIONS		SVLS		1								



Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
	10/11/05 1545		10/11/05 1545
 IS: Fed Ex	10/12/05 1630		10-13-05 1500

CHAIN OF CUSTODY

PARSONS

COC ID: 1006

Project Name: Tooele Industrial Area Contractor: Parsons-SLC

Project Manager: Ed Staes Installation: TEAD

Sample Coordinator: Kurt Alloway Sample Program:

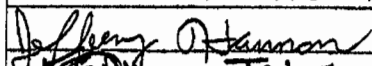
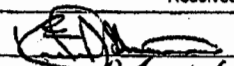
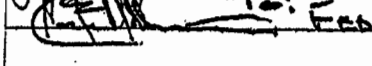
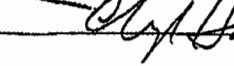
Parsons Point of Contact: Jan Barbas
 406 W. South Jordan Parkway
 Suite 300
 South Jordan, Utah 84095
 (801) 572-5999 FAX (801) 572-9069

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Cnts.
D-18	D-18	D-18GW005	WG	KB	N	1	10/11/05	1223	jos	192'	-	2
Analysis		Lab	Cooler	No. Cnts	AB Lot	EB Lot	TB Lot	Remarks:				
ALKALINITY		SVLS		-								
ANIONS		SVLS		1				*labeled e1229				
CATIONS		SVLS		1								

RECEIVED IN GOOD CONDITION
 UNDER COC

OCT 13 2005

IN: 

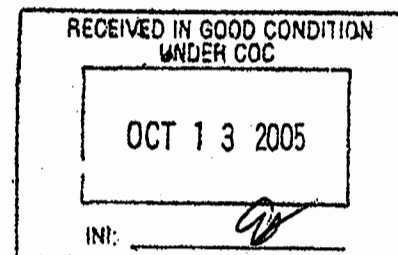
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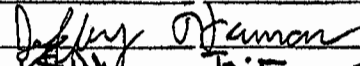
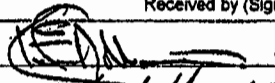
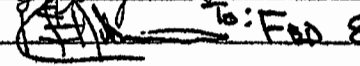
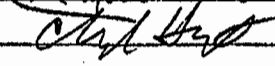
To: STL Laboratories, 880 Riverside Pkwy, W. Sacramento, CA, 95605 (916) 373-5600

Friday, September 16, 2005

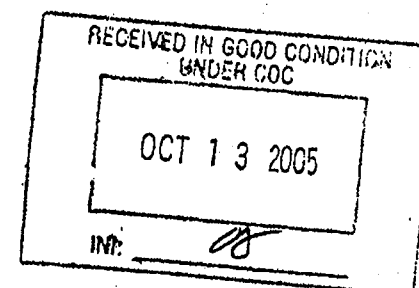
Page 1 of 1

CHAIN OF CUSTODY PARSONS COC ID: 1007		Project Name: Tooele Industrial Area		Contractor: Parsons-SLC		Parsons Point of Contact: Jan Barbas 406 W. South Jordan Parkway Suite 300 South Jordan, Utah 84095 (801) 572-5999 FAX (801) 572-9069						
		Project Manager: Ed Staes		Installation: TEAD								
		Sample Coordinator: Kurt Alloway		Sample Program:								
Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
D-18	D-18	D-18GW006	WG	KB	N	1	10/11/05	1240	JNA	205	-	2
Analysis		Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot	Remarks: # label e 1247				
ALKALINITY		SVLS		-								
ANIONS		SVLS		1								
CATIONS		SVLS		1								



Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
	10/11/05 1545		10/11/05 1545
 to: Fed Ex	10/12/05 1630		10-13-05 1500

CHAIN OF CUSTODY PARSONS COC ID: 1020		Project Name: Tooele Industrial Area		Contractor: Parsons-SLC		Parsons Point of Contact: Jan Barbas 406 W. South Jordan Parkway Suite 300 South Jordan, Utah 84095 (801) 572-5999 FAX (801) 572-9069						
		Project Manager: Ed Staes		Installation: TEAD								
		Sample Coordinator: Kurt Alloway		Sample Program:								
Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Cnts.
	FIELDQC	PARSTB14	WQ	NA	TB	1	10/11/05	0800	JMS	0	0	2
Analysis		Lab	Cooler	No. Cnts	AB Lot	EB Lot	TB Lot	Remarks:				
VOC		SVLS										



Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
<i>[Signature]</i>	10/11/05 1545	<i>[Signature]</i>	10/11/05 1545
<i>[Signature]</i>	10/12/05 1630	<i>[Signature]</i>	10/13/05 1500

SEVERN
TRENT

STL

LOT RECEIPT CHECKLIST
STL Sacramento

CLIENT Parsons PM 11 LOG # 35071

LOT# (QUANTIMS ID) G55130382 QUOTE# 62837 LOCATION W3B 10

DATE RECEIVED 10-13-05 TIME RECEIVED 9:30 Initials AK Date 10-13-05

DELIVERED BY ☒ FEDEX ☐ CA OVERNIGHT ☐ CLIENT
☐ AIRBORNE ☐ GOLDENSTATE ☐ DHL
☐ UPS ☐ BAX GLOBAL ☐ GO-GETTERS
☐ STL COURIER ☐ COURIERS ON DEMAND
☐ OTHER

CUSTODY SEAL STATUS ☒ INTACT ☐ BROKEN ☐ N/A

CUSTODY SEAL #(S) 438940, 438920

SHIPPING CONTAINER(S) ☐ STL ☒ CLIENT ☐ N/A

TEMPERATURE RECORD (IN °C) IR ☒ 3 ☐ OTHER

COC #(S) 1000-1007, 992-995, 1020

TEMPERATURE BLANK Observed: N/A Corrected: _____

SAMPLE TEMPERATURE

Observed: 4 4 3 Average: 4 Corrected Average: 4

COLLECTOR'S NAME: ☐ Verified from COC ☒ Not on COC

PH MEASURED ☒ YES ☐ ANOMALY ☒ N/A 0010-1305

LABELED BY.....

LABELS CHECKED BY.....

PEER REVIEW ☒ NA

SHORT HOLD TEST NOTIFICATION

SAMPLE RECEIVING

WETCHEM ☒ N/A

VOA-ENCORES ☒ N/A

☐ METALS NOTIFIED OF FILTER/PRESERVE VIA VERBAL & EMAIL ☒ N/A

☐ COMPLETE SHIPMENT RECEIVED IN GOOD CONDITION WITH APPROPRIATE TEMPERATURES, CONTAINERS, PRESERVATIVES ☒ N/A

☒ Clouseau ☐ TEMPERATURE EXCEEDED (2 °C - 6 °C)*1 ☐ N/A

☐ WET ICE ☐ BLUE ICE ☐ GEL PACK ☐ NO COOLING AGENTS USED ☒ PM NOTIFIED

Notes: all anion bottles have different time than coc
all coc

WATER, 6010B, Cations (Ca,Mg,K,Na)

Parsons Corporation

Client Sample ID: D-18FD001

TOTAL Metals

Lot-Sample #....: G5J130382-001

Matrix.....: WG

Date Sampled....: 10/11/05

Date Received...: 10/13/05

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #....: 5291147						
Calcium	102 J	0.50	mg/L	SW846 6010B	10/18/05	HMN2H1AA
Potassium	4.1	1.0	mg/L	SW846 6010B	10/18/05	HMN2H1AC
Magnesium	40.4	0.50	mg/L	SW846 6010B	10/18/05	HMN2H1AD
Sodium	89.8 J	0.50	mg/L	SW846 6010B	10/18/05	HMN2H1AE

NOTE(S):

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

Parsons Corporation

Client Sample ID: D-18GW001

TOTAL Metals

Lot-Sample #...: G5J130382-002

Matrix.....: WG

Date Sampled...: 10/11/05

Date Received...: 10/13/05

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 5291147						
Calcium	101 J	0.50	mg/L	SW846 6010B	10/18/05	HMN2K1AA
Potassium	4.0	1.0	mg/L	SW846 6010B	10/18/05	HMN2K1AC
Magnesium	39.5	0.50	mg/L	SW846 6010B	10/18/05	HMN2K1AD
Sodium	88.5 J	0.50	mg/L	SW846 6010B	10/18/05	HMN2K1AE

NOTE(S):

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

Parsons Corporation

Client Sample ID: D-18GW002

TOTAL Metals

Lot-Sample #...: G5J130382-003

Matrix.....: WG

Date Sampled...: 10/11/05

Date Received...: 10/13/05

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 5291147						
Calcium	106 J	0.50	mg/L	SW846 6010B	10/18/05	HMN2M1AA
Potassium	4.0	1.0	mg/L	SW846 6010B	10/18/05	HMN2M1AC
Magnesium	39.2	0.50	mg/L	SW846 6010B	10/18/05	HMN2M1AD
Sodium	83.2 J	0.50	mg/L	SW846 6010B	10/18/05	HMN2M1AE

NOTE(S):

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

Parsons Corporation

Client Sample ID: D-18GW003

TOTAL Metals

Lot-Sample #...: G5J130382-004

Matrix.....: WG

Date Sampled...: 10/11/05

Date Received...: 10/13/05

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>WORK ORDER #</u>
Prep Batch #...: 5291147						
Calcium	121 J	0.50	mg/L	SW846 6010B	10/18/05	HMN2V1AA
Potassium	4.1	1.0	mg/L	SW846 6010B	10/18/05	HMN2V1AC
Magnesium	40.6	0.50	mg/L	SW846 6010B	10/18/05	HMN2V1AD
Sodium	86.5 J	0.50	mg/L	SW846 6010B	10/18/05	HMN2V1AE

NOTE(S):

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

Parsons Corporation

Client Sample ID: D-18GW004

TOTAL Metals

Lot-Sample #....: G5J130382-005

Matrix.....: WG

Date Sampled....: 10/11/05

Date Received...: 10/13/05

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #....: 5291147						
Calcium	107 J	0.50	mg/L	SW846 6010B	10/18/05	HMN2W1AA
Potassium	4.0	1.0	mg/L	SW846 6010B	10/18/05	HMN2W1AC
Magnesium	39.7	0.50	mg/L	SW846 6010B	10/18/05	HMN2W1AD
Sodium	86.8 J	0.50	mg/L	SW846 6010B	10/18/05	HMN2W1AE

NOTE(S):

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

Parsons Corporation

Client Sample ID: D-18GW005

TOTAL Metals

Lot-Sample #...: G5J130382-006

Matrix.....: WG

Date Sampled...: 10/11/05

Date Received...: 10/13/05

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 5291147						
Calcium	158 J	0.50	mg/L	SW846 6010B	10/18/05	HMN2X1AA
Potassium	5.7	1.0	mg/L	SW846 6010B	10/18/05	HMN2X1AC
Magnesium	46.4	0.50	mg/L	SW846 6010B	10/18/05	HMN2X1AD
Sodium	90.7 J	0.50	mg/L	SW846 6010B	10/18/05	HMN2X1AE

NOTE(S) :

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

Parsons Corporation

Client Sample ID: D-18GW006

TOTAL Metals

Lot-Sample #....: G5J130382-007

Matrix.....: WG

Date Sampled....: 10/11/05

Date Received...: 10/13/05

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING</u> <u>LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION-</u> <u>ANALYSIS DATE</u>	<u>WORK</u> <u>ORDER #</u>
Prep Batch #....: 5291147						
Calcium	164 J	0.50	mg/L	SW846 6010B	10/18/05	HMN201AA
Potassium	4.4	1.0	mg/L	SW846 6010B	10/18/05	HMN201AC
Magnesium	42.4	0.50	mg/L	SW846 6010B	10/18/05	HMN201AD
Sodium	86.6 J	0.50	mg/L	SW846 6010B	10/18/05	HMN201AE

NOTE(S):

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

QC DATA ASSOCIATION SUMMARY

G5J130382

Sample Preparation and Analysis Control Numbers

<u>SAMPLE#</u>	<u>MATRIX</u>	<u>ANALYTICAL METHOD</u>	<u>LEACH BATCH #</u>	<u>PREP BATCH #</u>	<u>MS RUN#</u>
001	WG	SW846 6010B		5291147	5291103
002	WG	SW846 6010B		5291147	5291103
003	WG	SW846 6010B		5291147	5291103
004	WG	SW846 6010B		5291147	5291103
005	WG	SW846 6010B		5291147	5291103
006	WG	SW846 6010B		5291147	5291103
007	WG	SW846 6010B		5291147	5291103

METHOD BLANK REPORT

TOTAL Metals

Client Lot #....: G5J130382

Matrix.....: WATER

PARAMETER	RESULT	REPORTING			METHOD	PREPARATION-	WORK
		LIMIT	UNITS			ANALYSIS DATE	ORDER #
MB Lot-Sample #: G5J180000-147 Prep Batch #....: 5291147							
Calcium	0.028 B	0.50	mg/L	SW846 6010B	10/18/05	HMX4K1AA	
Magnesium	ND	0.50	mg/L	SW846 6010B	10/18/05	HMX4K1AD	
Potassium	ND	1.0	mg/L	SW846 6010B	10/18/05	HMX4K1AC	
Sodium	0.043 B	0.50	mg/L	SW846 6010B	10/18/05	HMX4K1AE	

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

B Estimated result. Result is less than RL.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

TOTAL Metals

Client Lot #...: G5J130382

Matrix.....: WATER

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>WORK ORDER #</u>
LCS Lot-Sample#: G5J180000-147 Prep Batch #...: 5291147					
Calcium	101	(90 - 114)	SW846 6010B	10/18/05	HMX4K1AF
Potassium	102	(90 - 110)	SW846 6010B	10/18/05	HMX4K1AG
Magnesium	102	(90 - 114)	SW846 6010B	10/18/05	HMX4K1AH
Sodium	99	(88 - 111)	SW846 6010B	10/18/05	HMX4K1AJ

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE DATA REPORT

TOTAL Metals

Client Lot #....: G5J130382

Matrix.....: WATER

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCNT RECVRY	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
LCS Lot-Sample#: G5J180000-147 Prep Batch #....: 5291147							
Calcium	50.0	50.7	mg/L	101	SW846 6010B	10/18/05	HMX4K1AF
Potassium	50.0	50.8	mg/L	102	SW846 6010B	10/18/05	HMX4K1AG
Magnesium	50.0	51.0	mg/L	102	SW846 6010B	10/18/05	HMX4K1AH
Sodium	50.0	49.5	mg/L	99	SW846 6010B	10/18/05	HMX4K1AJ

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE EVALUATION REPORT

TOTAL Metals

Client Lot #....: G5J130382

Matrix.....: WG

Date Sampled....: 10/11/05

Date Received...: 10/13/05

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD LIMITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
MS Lot-Sample #: G5J130382-002 Prep Batch #....: 5291147						
Calcium	96	(90 - 114)		SW846 6010B	10/18/05	HMN2K1AH
	96	(90 - 114)	0.06 (0-20)	SW846 6010B	10/18/05	HMN2K1AJ
Magnesium	101	(90 - 114)		SW846 6010B	10/18/05	HMN2K1AM
	101	(90 - 114)	0.47 (0-20)	SW846 6010B	10/18/05	HMN2K1AN
Potassium	106	(90 - 110)		SW846 6010B	10/18/05	HMN2K1AK
	103	(90 - 110)	2.1 (0-20)	SW846 6010B	10/18/05	HMN2K1AL
Sodium	97	(88 - 111)		SW846 6010B	10/18/05	HMN2K1AP
	97	(88 - 111)	0.07 (0-20)	SW846 6010B	10/18/05	HMN2K1AQ

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE DATA REPORT

TOTAL Metals

Client Lot #....: G5J130382

Matrix.....: WG

Date Sampled....: 10/11/05

Date Received...: 10/13/05

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
MS Lot-Sample #: G5J130382-002 Prep Batch #....: 5291147									
Calcium									
101	50.0	149	mg/L	96			SW846 6010B	10/18/05	HMN2K1AH
101	50.0	149	mg/L	96	0.06		SW846 6010B	10/18/05	HMN2K1AJ
Magnesium									
39.5	50.0	90.2	mg/L	101			SW846 6010B	10/18/05	HMN2K1AM
39.5	50.0	89.8	mg/L	101	0.47		SW846 6010B	10/18/05	HMN2K1AN
Potassium									
4.0	50.0	56.8	mg/L	106			SW846 6010B	10/18/05	HMN2K1AK
4.0	50.0	55.6	mg/L	103	2.1		SW846 6010B	10/18/05	HMN2K1AL
Sodium									
88.5	50.0	137	mg/L	97			SW846 6010B	10/18/05	HMN2K1AP
88.5	50.0	137	mg/L	97	0.07		SW846 6010B	10/18/05	HMN2K1AQ

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

General Chemistry, Various Methods

Parsons Corporation

Client Sample ID: D-18FD001

General Chemistry

Lot-Sample #....: G5J130382-001

Work Order #....: HMN2H

Matrix.....: WG

Date Sampled....: 10/11/05

Date Received...: 10/13/05

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Chloride	295 Q	10.0	mg/L	MCAWW 300.0A	10/18/05	5292325
		MDL.....: 0.063				
Sulfate	56.7 Q	2.0	mg/L	MCAWW 300.0A	10/17/05	5291413
		MDL.....: 0.14				
Total Alkalinity	160	5.0	mg/L	MCAWW 310.1	10/24/05	5294172
		MDL.....: 5.0				

NOTE(S):

RL Reporting Limit

Q Elevated reporting limit. The reporting limit is elevated due to high analyte levels.

Parsons Corporation

Client Sample ID: D-18GW001

General Chemistry

Lot-Sample #....: G5J130382-002

Work Order #....: HMN2K

Matrix.....: WG

Date Sampled....: 10/11/05

Date Received...: 10/13/05

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Chloride	295 Q	10.0	mg/L	MCAWW 300.0A	10/18/05	5292325
		MDL.....: 0.063				
Sulfate	55.6 Q	2.0	mg/L	MCAWW 300.0A	10/17/05	5291413
		MDL.....: 0.14				
Total Alkalinity	160	5.0	mg/L	MCAWW 310.1	10/24/05	5294172
		MDL.....: 5.0				

NOTE(S):

RL Reporting Limit

Q Elevated reporting limit. The reporting limit is elevated due to high analyte levels.

Parsons Corporation

Client Sample ID: D-18GW002

General Chemistry

Lot-Sample #....: G5J130382-003

Work Order #....: HMN2M

Matrix.....: WG

Date Sampled....: 10/11/05

Date Received...: 10/13/05

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Chloride	283 Q	10.0	mg/L	MCAWW 300.0A	10/18/05	5292325
		MDL.....: 0.063				
Sulfate	54.6 Q	2.0	mg/L	MCAWW 300.0A	10/17/05	5291413
		MDL.....: 0.14				
Total Alkalinity	161	5.0	mg/L	MCAWW 310.1	10/24/05	5294172
		MDL.....: 5.0				

NOTE(S):

RL Reporting Limit

Q Elevated reporting limit. The reporting limit is elevated due to high analyte levels.

Parsons Corporation

Client Sample ID: D-18GW003

General Chemistry

Lot-Sample #....: G5J130382-004

Work Order #....: HMN2V

Matrix.....: WG

Date Sampled....: 10/11/05

Date Received...: 10/13/05

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Chloride	281 Q	10.0	mg/L	MCAWW 300.0A	10/18/05	5292325
		MDL.....: 0.063				
Sulfate	53.0 Q	2.0	mg/L	MCAWW 300.0A	10/17/05	5291413
		MDL.....: 0.14				
Total Alkalinity	162	5.0	mg/L	MCAWW 310.1	10/24/05	5294172
		MDL.....: 5.0				

NOTE(S):

RL Reporting Limit

Q Elevated reporting limit. The reporting limit is elevated due to high analyte levels.

Parsons Corporation

Client Sample ID: D-18GW004

General Chemistry

Lot-Sample #....: G5J130382-005

Work Order #....: HMN2W

Matrix.....: WG

Date Sampled....: 10/11/05

Date Received...: 10/13/05

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Chloride	282 Q	10.0	mg/L	MCAWW 300.0A	10/18/05	5292325
		MDL.....: 0.063				
Sulfate	52.9 Q	2.0	mg/L	MCAWW 300.0A	10/17/05	5291413
		MDL.....: 0.14				
Total Alkalinity	174	5.0	mg/L	MCAWW 310.1	10/24/05	5294172
		MDL.....: 5.0				

NOTE(S):

RL Reporting Limit

Q Elevated reporting limit. The reporting limit is elevated due to high analyte levels.

Parsons Corporation

Client Sample ID: D-18GW005

General Chemistry

Lot-Sample #....: G5J130382-006

Work Order #....: HMN2X

Matrix.....: WG

Date Sampled....: 10/11/05

Date Received...: 10/13/05

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Chloride	283 Q	10.0	mg/L	MCAWW 300.0A	10/18/05	5292325
	MDL.....: 0.063					
Sulfate	53.5 Q	2.0	mg/L	MCAWW 300.0A	10/17/05	5291413
	MDL.....: 0.14					
Total Alkalinity	159	5.0	mg/L	MCAWW 310.1	10/24/05	5294172
	MDL.....: 5.0					

NOTE(S):

RL Reporting Limit

Q Elevated reporting limit. The reporting limit is elevated due to high analyte levels.

Parsons Corporation

Client Sample ID: D-18GW006

General Chemistry

Lot-Sample #....: G5J130382-007

Work Order #....: HMN20

Matrix.....: WG

Date Sampled....: 10/11/05

Date Received...: 10/13/05

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Chloride	282 Q	10.0	mg/L	MCAWW 300.0A	10/18/05	5292325
	MDL.....: 0.063					
Sulfate	53.0 Q	2.0	mg/L	MCAWW 300.0A	10/17/05	5291413
	MDL.....: 0.14					
Total Alkalinity	161	5.0	mg/L	MCAWW 310.1	10/24/05	5294172
	MDL.....: 5.0					

NOTE(S):

RL Reporting Limit

Q Elevated reporting limit. The reporting limit is elevated due to high analyte levels.

QC DATA ASSOCIATION SUMMARY

G5J130382

Sample Preparation and Analysis Control Numbers

<u>SAMPLE#</u>	<u>MATRIX</u>	<u>ANALYTICAL METHOD</u>	<u>LEACH BATCH #</u>	<u>PREP BATCH #</u>	<u>MS RUN#</u>
001	WG	MCAWW 300.0A		5292325	5292210
	WG	MCAWW 300.0A		5291413	5291265
	WG	MCAWW 310.1		5294172	5297299
002	WG	MCAWW 300.0A		5292325	5292210
	WG	MCAWW 300.0A		5291413	5291265
	WG	MCAWW 310.1		5294172	5297299
003	WG	MCAWW 300.0A		5292325	5292210
	WG	MCAWW 300.0A		5291413	5291265
	WG	MCAWW 310.1		5294172	5297299
004	WG	MCAWW 300.0A		5292325	5292210
	WG	MCAWW 300.0A		5291413	5291265
	WG	MCAWW 310.1		5294172	5297299
005	WG	MCAWW 300.0A		5292325	5292210
	WG	MCAWW 300.0A		5291413	5291265
	WG	MCAWW 310.1		5294172	5297299
006	WG	MCAWW 300.0A		5292325	5292210
	WG	MCAWW 300.0A		5291413	5291265
	WG	MCAWW 310.1		5294172	5297299
007	WG	MCAWW 300.0A		5292325	5292210
	WG	MCAWW 300.0A		5291413	5291265
	WG	MCAWW 310.1		5294172	5297299

METHOD BLANK REPORT

General Chemistry

Client Lot #....: G5J130382

Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Chloride	ND	Work Order #: HM3GP1AA 1.0	mg/L	MB Lot-Sample #: G5J190000-325 MCAWW 300.0A	10/18/05	5292325
Sulfate	ND	Work Order #: HM1GF1AA 1.0	mg/L	MB Lot-Sample #: G5J180000-413 MCAWW 300.0A	10/17/05	5291413
Total Alkalinity	ND	Work Order #: HNG3C1AA 5.0	mg/L	MB Lot-Sample #: G5J210000-172 MCAWW 310.1	10/24/05	5294172

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

General Chemistry

Client Lot #....: G5J130382

Matrix.....: WATER

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>PREP BATCH #</u>
Chloride	102	Work Order #: HM3GP1AC LCS Lot-Sample#: G5J190000-325 (90 - 110)	MCAWW 300.0A	10/18/05	5292325
Sulfate	98	Work Order #: HM1GF1AC LCS Lot-Sample#: G5J180000-413 (90 - 110)	MCAWW 300.0A	10/17/05	5291413
Total Alkalinity	109	Work Order #: HNG3C1AC LCS Lot-Sample#: G5J210000-172 (90 - 110)	MCAWW 310.1	10/24/05	5294172

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE DATA REPORT

General Chemistry

Client Lot #...: G5J130382

Matrix.....: WATER

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECVRY	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Chloride	25.0	25.6	mg/L	102	MCAWW 300.0A	10/18/05	5292325
Sulfate	25.0	24.4	mg/L	98	MCAWW 300.0A	10/17/05	5291413
Total Alkalinity	123	134	mg/L	109	MCAWW 310.1	10/24/05	5294172

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE EVALUATION REPORT

General Chemistry

Client Lot #....: G5J130382

Matrix.....: WG

Date Sampled....: 10/11/05

Date Received...: 10/13/05

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Chloride			WO#:	HMN2K1AR-MS/HMN2K1AT-MSD	MS Lot-Sample #:	G5J130382-002	
	100	(90 - 110)			MCAWW 300.0A	10/18/05	5292325
	98	(90 - 110)	0.82	(0-10)	MCAWW 300.0A	10/18/05	5292325
Sulfate			WO#:	HMN2K1AU-MS/HMN2K1AV-MSD	MS Lot-Sample #:	G5J130382-002	
	98	(90 - 110)			MCAWW 300.0A	10/17/05	5291413
	97	(90 - 110)	0.46	(0-10)	MCAWW 300.0A	10/17/05	5291413

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE DATA REPORT

General Chemistry

Client Lot #....: G5J130382

Matrix.....: WG

Date Sampled....: 10/11/05

Date Received...: 10/13/05

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Chloride			WO#: HMN2K1AR-MS/HMN2K1AT-MSD				MS Lot-Sample #: G5J130382-002		
	295	200	495	mg/L	100		MCAWW 300.0A	10/18/05	5292325
	295	200	491	mg/L	98	0.82	MCAWW 300.0A	10/18/05	5292325
Sulfate			WO#: HMN2K1AU-MS/HMN2K1AV-MSD				MS Lot-Sample #: G5J130382-002		
	55.6	50.0	104	mg/L	98		MCAWW 300.0A	10/17/05	5291413
	55.6	50.0	104	mg/L	97	0.46	MCAWW 300.0A	10/17/05	5291413

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

SAMPLE DUPLICATE EVALUATION REPORT

General Chemistry

Client Lot #....: G5J130382

Work Order #....: HMN2H-SMP
HMN2H-DUP

Matrix.....: WG

Date Sampled....: 10/11/05

Date Received...: 10/13/05

PARAM	RESULT	DUPLICATE RESULT	UNITS	RPD	RPD LIMIT	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Total Alkalinity	160	159	mg/L	0.27	(0-10)	SD Lot-Sample #: G5J130382-001 MCAWW 310.1	10/24/05	5294172

AUTOMATED DATA REVIEW SUMMARY

Facility: SWMU 58
Event: 2004_2005 SWMU 58 Phase II RFI GW
Contract: 9T9H213C
Sample Delivery Group: G5J130382

Field Contractor: Parsons Engineering Science, Salt Lake City
Laboratory Contractor: SEVERN TRENT LABS., WEST SACRAMENTO, CA
Data Review Contractor: Synectics, Sacramento, CA
Guidance Document: *Final Phase II RCRA Facility Investigation SWMU-58 Workplan, December 2003*

Analytical Method	Normal Samples	Field QC Samples
E300	6	1
E310.1	6	1
SW6010B	6	1
SW8260B	4	1

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in Final Phase II RCRA Facility Investigation SWMU-58 Workplan, December 2003 to the extent possible. Where definitive guidance is not provided, data has been evaluated in a conservative manner using professional judgment. In cases where two qualifiers are listed as an action, such as "J/UJ", the first qualifier applies to positive results, and the second to non-detect results.

Samples were collected by Parsons Engineering Science, Salt Lake City; analyses were performed by SEVERN TRENT LABS., WEST SACRAMENTO, CA and were reported under sample delivery group (SDG) G5J130382. Results have been evaluated electronically using electronic data deliverables (EDDs) provided by the laboratory. The laboratory data summary forms (hard copy) have been reviewed during this effort and compared to the automated review output. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative. The following quality control elements were evaluated during this review effort:

- Technical Holding Times
- Continuing Calibration Verification
- Method Blank Contamination
- Field Blank Contamination
- Blank Spike Accuracy
- Blank Spike Precision
- Matrix Spike Accuracy
- Matrix Spike Precision
- Surrogate Recovery
- Laboratory Duplicate Precision
- Field Duplicate Precision

A minimum of ten percent of sample and QC results were manually evaluated for compliance with project specific requirements and consistency with hard copy results. The following reports were generated during the evaluation of this data set and are presented as attachments to this report as applicable.

Data Submission Warnings – Warnings encountered during the data submission process are evaluated and their affect on data quality is discussed in the narrative.

Batch – The analytical batch report is reviewed for completeness and compliance with project specific requirements. Incomplete or non-compliant run sequences are identified and their impact on data quality are discussed in the narrative.

QC Outlier – Results exceeding the evaluation criteria are reviewed for compliance with project requirements and a minimum of ten percent of the non-compliant QC values reported electronically are verified for consistency with hard-copy values.

Qualified Results – Qualified results are evaluated for compliance with project requirements and ten percent of qualified results are verified for consistency with the QC Outlier Report.

Field Duplicate – Field duplicate comparison results are evaluated for compliance with project requirements and ten percent of values reported are verified for consistency with the hard-copy data.

Rejected Results – All rejected results are evaluated for compliance with project requirements. The reason for rejection of the data is verified against hard copy data.

Analytical deficiencies, project non-compliance issues and inconsistencies with hard copy results observed during ADR evaluation process and their impact on data quality are summarized in the ADR narrative.

Out of control events experienced by the laboratory have warranted the qualification of 0 % (0 results) and the rejection of 0 % (0 results) of the data set. These deficiencies are detailed in the referenced attachments, and discussed in the ADR narrative, where appropriate.

Evin McKinney

Released by

Date

Reason and Comment Codes

<u>Code</u>	<u>Definition</u>
C1	Diluted Out
C2	Flag Parent Only
C2S	Flag Parent (Soil); Batch (Water)
C3	No Action
C4	No QC Outliers
C5	One or both values <5x RL
C6	Recalculated Value
C7	Material Blanks
C8	Spike Insignificant
C9	No Flags; set to ND by method/cal. blank

Reasons

<u>Code</u>	<u>Definition</u>
A	Serial dilution
B	Calibration Blank - Negative
	Negative Blank
B1	Blank
B2	Calibration Blank
C	Continuing Calibration Verification
	Continuing Calibration Verification RRF
D	BS RPD
	Field Duplicate RPD
D1	Lab Replicate RPD
D2	MS RPD
E	Exceeds LinearCalibration Range
F	Hydrocarbon pattern does not match standard
G	Initial Calibration RRF
	Initial Calibration RSD
H	Test Hold Time
	Prep Hold Time
I	Internal standard
K1	Equip Blank
K2	Field Blank
K3	Trip Blank
L	LCS Recovery
M	MS Recovery
N	Blank - No Action
O	Interference check sample
P	Column RPD
Q	Material Blank
S	Surrogate
T	Receipt Temperature
TI	Tentatively Identified Compound
TR	Trace Level Detect
W	Column breakdown (pesticides)
X	Raised reporting limit
Y	Analyte not confirmed on second column

ADR CASE NARRATIVE

Laboratory ID: G5J130382

Prior to loading and processing data, modifications to the project setup may be requested by the laboratory and/or contractor, and approved by the client. These modifications allow the loading of data that was not in complete agreement with the project guidance document; in some cases, variances to the project document may be in process, in others, the changes are required to accept data that had not been generated in compliance with the project guidance document. All project setup modifications are listed below:

1. Missing CV Check

For the requirements of this project, electronic continuing calibration verifications (CV) were not provided for review for method E300. Thus, the Missing CV check was changed from an error to a warning to allow loading of the data without electronic CVs, per the project chemist.

Chemistry Data Quality

The data submission process incorporates a series of stored procedures designed to identify conditions in electronic data deliverables (EDD) that would affect chemistry data quality. These conditions will not result in the qualification of the data; however, these findings should be reviewed for possible contractual non-compliance. A brief explanation of each finding encountered for this data set and the potential impact on chemistry data quality is summarized below.

There were no issues affecting chemistry data quality associated with this sample delivery group.

Data Verification

The data verification process includes a manual review of information on the chains of custody and laboratory case narratives, a check of all rejected results and a minimum of 10 percent of sample and QC results for consistency with hard copy reports, and a cursory review of all reports generated during the automated review process. The following comments are associated with the verification process:

1. Anions by E300

It was noted that the laboratory did not provide CV information in the EDD. The data was manually reviewed and found to be within project acceptance limits. No qualifiers have been applied on this basis.

2. Volatiles by SW8260

An matrix spike (MS) was not provided on the EDD for the analytical batch for this SDG. No qualifiers have been applied on this basis.

All of the reports utilized during the data verification process are provided as attachments to this report.

Batch Report

Facility: SWMU 58
 Lab: SVLS
 Filename: G5J130382
 Status: Certified - 12/2/2005
 User: BonnieMcNeill

Test Method: E300
 Leach Method: NONE

<u>Test Batch</u>	<u>Prep Batch</u>	<u>Leach Batch</u>	<u>Location</u>	<u>Matrix</u>	<u>Field Sample ID</u>	<u>Lab Sample ID</u>	<u>Test Date and Time</u>	<u>Sample Type</u>
IC61017	NA	NA	LABQC	WQ		G5J180000413	10/17/2005 9:52:00AM	BS1
	NA	NA	LABQC	WQ		G5J180000413	10/17/2005 10:09:00AM	LB1
	NA	NA	D-18	WG	D-18GW001	G5J130382002	10/17/2005 10:11:00AM	N1
	NA	NA	D-18	WG	D-18FD001	G5J130382001	10/17/2005 2:53:00PM	FD1
	NA	NA	D-18	WG	D-18GW002	G5J130382003	10/17/2005 3:28:00PM	N1
	NA	NA	D-18	WG	D-18GW003	G5J130382004	10/17/2005 3:46:00PM	N1
	NA	NA	D-18	WG	D-18GW004	G5J130382005	10/17/2005 4:03:00PM	N1
	NA	NA	D-18	WG	D-18GW005	G5J130382006	10/17/2005 4:21:00PM	N1
	NA	NA	D-18	WG	D-18GW006	G5J130382007	10/17/2005 4:38:00PM	N1
	NA	NA	D-18	WG	D-18GW001	G5J130382002	10/17/2005 6:23:00PM	MS1
	NA	NA	D-18	WG	D-18GW001	G5J130382002	10/17/2005 6:23:00PM	SD1
IC61018	NA	NA	LABQC	WQ		G5J190000325	10/18/2005 11:58:00AM	BS1
	NA	NA	LABQC	WQ		G5J190000325	10/18/2005 12:15:00PM	LB1
	NA	NA	D-18	WG	D-18GW001	G5J130382002	10/18/2005 12:33:00PM	N1
	NA	NA	D-18	WG	D-18GW001	G5J130382002	10/18/2005 12:50:00PM	MS1
	NA	NA	D-18	WG	D-18GW001	G5J130382002	10/18/2005 1:08:00PM	SD1
	NA	NA	D-18	WG	D-18GW002	G5J130382003	10/18/2005 1:25:00PM	N1
	NA	NA	D-18	WG	D-18GW003	G5J130382004	10/18/2005 1:43:00PM	N1
	NA	NA	D-18	WG	D-18GW004	G5J130382005	10/18/2005 2:00:00PM	N1
	NA	NA	D-18	WG	D-18GW005	G5J130382006	10/18/2005 2:18:00PM	N1
	NA	NA	D-18	WG	D-18GW006	G5J130382007	10/18/2005 2:35:00PM	N1
	NA	NA	D-18	WG	D-18FD001	G5J130382001	10/18/2005 2:53:00PM	FD1

Batch Report

Facility: SWMU 58
Lab: SVLS
Filename: G5J130382
Status: Certified - 12/2/2005
User: BonnieMcNeill

Test Method: E310.1
Leach Method: NONE

<u>Test Batch</u>	<u>Prep Batch</u>	<u>Leach Batch</u>	<u>Location</u>	<u>Matrix</u>	<u>Field Sample ID</u>	<u>Lab Sample ID</u>	<u>Test Date and Time</u>	<u>Sample Type</u>
AT21024	NA	NA	LABQC	WQ		G5J210000172	10/24/2005 2:15:00PM	BS1
	NA	NA	LABQC	WQ		G5J210000172	10/24/2005 2:22:00PM	LB1
	NA	NA	D-18	WG	D-18FD001	G5J130382001	10/24/2005 2:29:00PM	FD1
	NA	NA	D-18	WG	D-18FD001	G5J130382001	10/24/2005 2:36:00PM	LR1
	NA	NA	D-18	WG	D-18GW001	G5J130382002	10/24/2005 2:43:00PM	N1
	NA	NA	D-18	WG	D-18GW002	G5J130382003	10/24/2005 2:50:00PM	N1
	NA	NA	D-18	WG	D-18GW003	G5J130382004	10/24/2005 2:57:00PM	N1
	NA	NA	D-18	WG	D-18GW004	G5J130382005	10/24/2005 3:05:00PM	N1
	NA	NA	D-18	WG	D-18GW005	G5J130382006	10/24/2005 3:12:00PM	N1
	NA	NA	D-18	WG	D-18GW006	G5J130382007	10/24/2005 3:19:00PM	N1

Batch Report

Facility: SWMU 58
 Lab: SVLS
 Filename: G5J130382
 Status: Certified - 12/2/2005
 User: BonnieMcNeill

Test Method: SW6010B
 Leach Method: NONE

<u>Test Batch</u>	<u>Prep Batch</u>	<u>Leach Batch</u>	<u>Location</u>	<u>Matrix</u>	<u>Field Sample ID</u>	<u>Lab Sample ID</u>	<u>Test Date and Time</u>	<u>Sample Type</u>
P051018	NA	NA	LABQC	WQ		ICV4	10/18/2005 6:02:00PM	CV1
	NA	NA	LABQC	WQ		ICB	10/18/2005 6:10:00PM	CB1
	NA	NA	LABQC	WQ		CCV	10/18/2005 7:03:00PM	CV2
	NA	NA	LABQC	WQ		CCB	10/18/2005 7:07:00PM	CB2
	NA	NA	LABQC	WQ		CCV	10/18/2005 7:56:00PM	CV3
	NA	NA	LABQC	WQ		CCB	10/18/2005 8:00:00PM	CB3
	5291147	NA	LABQC	WQ		G5J180000147	10/18/2005 8:04:00PM	LB1
	5291147	NA	LABQC	WQ		G5J180000147	10/18/2005 8:08:00PM	BS1
	NA	NA	LABQC	WQ		CCV	10/18/2005 8:38:00PM	CV4
	NA	NA	LABQC	WQ		CCB	10/18/2005 8:42:00PM	CB4
	5291147	NA	D-18	WG	D-18FD001	G5J130382001	10/18/2005 8:46:00PM	FD1
	5291147	NA	D-18	WG	D-18GW001	G5J130382002	10/18/2005 8:50:00PM	N1
	5291147	NA	D-18	WG	D-18GW001	G5J130382002	10/18/2005 8:58:00PM	MS1
	5291147	NA	D-18	WG	D-18GW001	G5J130382002	10/18/2005 9:02:00PM	SD1
	5291147	NA	D-18	WG	D-18GW002	G5J130382003	10/18/2005 9:16:00PM	N1
	5291147	NA	D-18	WG	D-18GW003	G5J130382004	10/18/2005 9:20:00PM	N1
	5291147	NA	D-18	WG	D-18GW004	G5J130382005	10/18/2005 9:24:00PM	N1
	5291147	NA	D-18	WG	D-18GW005	G5J130382006	10/18/2005 9:29:00PM	N1
	NA	NA	LABQC	WQ		CCV	10/18/2005 9:36:00PM	CV5
	NA	NA	LABQC	WQ		CCB	10/18/2005 9:40:00PM	CB5
	5291147	NA	D-18	WG	D-18GW006	G5J130382007	10/18/2005 9:44:00PM	N1
	NA	NA	LABQC	WQ		CCV	10/18/2005 10:00:00PM	CV6
	NA	NA	LABQC	WQ		CCB	10/18/2005 10:04:00PM	CB6
	NA	NA	LABQC	WQ		CCV	10/18/2005 10:59:00PM	CV7
	NA	NA	LABQC	WQ		CCB	10/18/2005 11:03:00PM	CB7
	NA	NA	LABQC	WQ		CCV	10/18/2005 11:48:00PM	CV8
	NA	NA	LABQC	WQ		CCB	10/18/2005 11:52:00PM	CB8

Batch Report

Facility: SWMU 58
Lab: SVLS
Filename: G5J130382
Status: Certified - 12/2/2005
User: BonnieMcNeill

Test Method: SW6010B
Leach Method: NONE

<u>Test Batch</u>	<u>Prep Batch</u>	<u>Leach Batch</u>	<u>Location</u>	<u>Matrix</u>	<u>Field Sample ID</u>	<u>Lab Sample ID</u>	<u>Test Date and Time</u>	<u>Sample Type</u>
P051019	NA	NA	LABQC	WQ		CCV	10/19/2005 12:45:00AM	CV9
	NA	NA	LABQC	WQ		CCB	10/19/2005 12:49:00AM	CB9
	NA	NA	LABQC	WQ		CCV	10/19/2005 1:23:00AM	CV10
	NA	NA	LABQC	WQ		CCB	10/19/2005 1:27:00AM	CB10

Batch Report

Facility: SWMU 58
Lab: SVLS
Filename: G5J130382
Status: Certified - 12/2/2005
User: BonnieMcNeill

Test Method: SW8260B
Leach Method: NONE

<u>Test Batch</u>	<u>Prep Batch</u>	<u>Leach Batch</u>	<u>Location</u>	<u>Matrix</u>	<u>Field Sample ID</u>	<u>Lab Sample ID</u>	<u>Test Date and Time</u>	<u>Sample Type</u>
HP91006	NA	NA	LABQC	WQ		LCS/SS	10/6/2005 6:22:00PM	CV1
	NA	NA	LABQC	WQ		LCS/SS	10/6/2005 6:45:00PM	CV2
HP91020	NA	NA	LABQC	WQ		HSL020	10/20/2005 11:59:00AM	CV3
	5294325	NA	LABQC	WQ		G5J210000325	10/20/2005 12:39:00PM	BS1
	5294325	NA	LABQC	WQ		G5J210000325	10/20/2005 1:02:00PM	BD1
	5294325	NA	LABQC	WQ		G5J210000325	10/20/2005 1:54:00PM	LB1
	5294325	NA	C-47F	WG	C-47FGW001	G5J130382008	10/20/2005 4:28:00PM	N1
	5294325	NA	C-47F	WG	C-47FGW002	G5J130382009	10/20/2005 4:52:00PM	N1
	5294325	NA	C-47F	WG	C-47FGW003	G5J130382010	10/20/2005 5:15:00PM	N1
	5294325	NA	C-47F	WG	C-47FGW004	G5J130382011	10/20/2005 5:37:00PM	N1
	5294325	NA	FIELDQC	WQ	PARSTB14	G5J130382012	10/20/2005 6:00:00PM	TB1

QC Outliers

Facility: SWMU 58
 Event: 2004_2005 SWMU 58 Phase II RFI GW
 Reference: 9T9H213C

SDG G5J130382

Test/Leach	QCElement	Sample	Type	Dil'n	Analyte	Result	Units	Warning	Control	Qualifier	Reason	Cmnt.
								Limits	Limits			
SW6010B/NONE	Blank Cont.	P5291147LABQC	LB1	1.00	Calcium	0.028	MG/L	< 0.0067	< 0.5	U / None	B1	
SW6010B/NONE	Blank Cont.	P5291147LABQC	LB1	1.00	Sodium	0.043	MG/L	< 0.0082	< 0.5	U / None	B1	
SW6010B/NONE	Blk. Cont.	TP051018LABQC	CB1	1.00	Potassium	0.075	MG/L	< 0.045	< 1	U / None	B2	
SW6010B/NONE	Blk. Cont.	TP051018LABQC	CB1	1.00	Sodium	0.81	MG/L	< 0.0082	< 0.5	U / None	B2	
SW6010B/NONE	Blk. Cont.	TP051018LABQC	CB2	1.00	Sodium	0.52	MG/L	< 0.0082	< 0.5	U / None	B2	
SW6010B/NONE	Blk. Cont.	TP051018LABQC	CB3	1.00	Calcium	0.0074	MG/L	< 0.0067	< 0.5	U / None	B2	
SW6010B/NONE	Blk. Cont.	TP051018LABQC	CB3	1.00	Sodium	1.1	MG/L	< 0.0082	< 0.5	U / None	B2	
SW6010B/NONE	Blk. Cont.	TP051018LABQC	CB4	1.00	Potassium	0.071	MG/L	< 0.045	< 1	U / None	B2	
SW6010B/NONE	Blk. Cont.	TP051018LABQC	CB4	1.00	Sodium	0.68	MG/L	< 0.0082	< 0.5	U / None	B2	
SW6010B/NONE	Blk. Cont.	TP051018LABQC	CB5	1.00	Potassium	0.051	MG/L	< 0.045	< 1	U / None	B2	
SW6010B/NONE	Blk. Cont.	TP051018LABQC	CB6	1.00	Potassium	0.064	MG/L	< 0.045	< 1	U / None	B2	
SW6010B/NONE	Blk. Cont.	TP051018LABQC	CB6	1.00	Sodium	0.33	MG/L	< 0.0082	< 0.5	U / None	B2	
SW6010B/NONE	Blk. Cont.	TP051018LABQC	CB7	1.00	Calcium	0.0078	MG/L	< 0.0067	< 0.5	U / None	B2	
SW6010B/NONE	Blk. Cont.	TP051018LABQC	CB7	1.00	Sodium	0.96	MG/L	< 0.0082	< 0.5	U / None	B2	
SW6010B/NONE	Blk. Cont.	TP051018LABQC	CB8	1.00	Calcium	0.0081	MG/L	< 0.0067	< 0.5	U / None	B2	
SW6010B/NONE	Blk. Cont.	TP051018LABQC	CB8	1.00	Sodium	0.051	MG/L	< 0.0082	< 0.5	U / None	B2	
SW6010B/NONE	Blk. Cont.	TP051019LABQC	CB1C	1.00	Calcium	0.0089	MG/L	< 0.0067	< 0.5	U / None	B2	
SW6010B/NONE	Blk. Cont.	TP051019LABQC	CB1C	1.00	Potassium	0.046	MG/L	< 0.045	< 1	U / None	B2	
SW6010B/NONE	Blk. Cont.	TP051019LABQC	CB1C	1.00	Sodium	0.11	MG/L	< 0.0082	< 0.5	U / None	B2	
SW6010B/NONE	Blk. Cont.	TP051019LABQC	CB9	1.00	Sodium	0.94	MG/L	< 0.0082	< 0.5	U / None	B2	

Detected Results

Facility: SWMU 58
Event: 2004_2005 SWMU 58 Phase II RFI GW
Reference: ISSS-539-01

SDG: G5J130382

Inorganic Anions In Water By Ion Chromatography

<u>Test/Leach</u>	<u>Matrix</u>	<u>Field Sample ID</u>	<u>Type</u>	<u>Analyte</u>	<u>RL</u>	<u>Lab Result</u>	<u>Qualified Result</u>	<u>Units</u>	<u>Reason</u>
E300/NONE	WG	D-18FD001	FD	Chloride	10	300 q	300	MG/L	
E300/NONE	WG	D-18FD001	FD	Sulfate (as SO4)	2.0	57 q	57	MG/L	
E300/NONE	WG	D-18GW001	N	Chloride	10	300 q	300	MG/L	
E300/NONE	WG	D-18GW001	N	Sulfate (as SO4)	2.0	56 q	56	MG/L	
E300/NONE	WG	D-18GW002	N	Chloride	10	280 q	280	MG/L	
E300/NONE	WG	D-18GW002	N	Sulfate (as SO4)	2.0	55 q	55	MG/L	
E300/NONE	WG	D-18GW003	N	Chloride	10	280 q	280	MG/L	
E300/NONE	WG	D-18GW003	N	Sulfate (as SO4)	2.0	53 q	53	MG/L	
E300/NONE	WG	D-18GW004	N	Chloride	10	280 q	280	MG/L	
E300/NONE	WG	D-18GW004	N	Sulfate (as SO4)	2.0	53 q	53	MG/L	
E300/NONE	WG	D-18GW005	N	Chloride	10	280 q	280	MG/L	
E300/NONE	WG	D-18GW005	N	Sulfate (as SO4)	2.0	54 q	54	MG/L	
E300/NONE	WG	D-18GW006	N	Chloride	10	280 q	280	MG/L	
E300/NONE	WG	D-18GW006	N	Sulfate (as SO4)	2.0	53 q	53	MG/L	

Alkalinity (Titrimetric)

<u>Test/Leach</u>	<u>Matrix</u>	<u>Field Sample ID</u>	<u>Type</u>	<u>Analyte</u>	<u>RL</u>	<u>Lab Result</u>	<u>Qualified Result</u>	<u>Units</u>	<u>Reason</u>
E310.1/NONE	WG	D-18FD001	FD	Alkalinity, Total (as CaCO3)	5.0	160	160	MG/L	
E310.1/NONE	WG	D-18GW001	N	Alkalinity, Total (as CaCO3)	5.0	160	160	MG/L	
E310.1/NONE	WG	D-18GW002	N	Alkalinity, Total (as CaCO3)	5.0	160	160	MG/L	
E310.1/NONE	WG	D-18GW003	N	Alkalinity, Total (as CaCO3)	5.0	160	160	MG/L	
E310.1/NONE	WG	D-18GW004	N	Alkalinity, Total (as CaCO3)	5.0	170	170	MG/L	
E310.1/NONE	WG	D-18GW005	N	Alkalinity, Total (as CaCO3)	5.0	160	160	MG/L	
E310.1/NONE	WG	D-18GW006	N	Alkalinity, Total (as CaCO3)	5.0	160	160	MG/L	

SDG: G5J130382

Trace Metals by ICP

<u>Test/Leach</u>	<u>Matrix</u>	<u>Field Sample ID</u>	<u>Type</u>	<u>Analyte</u>	<u>RL</u>	<u>Lab Result</u>	<u>Qualified Result</u>	<u>Units</u>	<u>Reason</u>
SW6010B/NONE	WG	D-18FD001	FD	Calcium	0.50	100 B	100	MG/L	
SW6010B/NONE	WG	D-18FD001	FD	Magnesium	0.50	40	40	MG/L	
SW6010B/NONE	WG	D-18FD001	FD	Potassium	1.0	4.1	4.1	MG/L	
SW6010B/NONE	WG	D-18FD001	FD	Sodium	0.50	90 B	90	MG/L	
SW6010B/NONE	WG	D-18GW001	N	Calcium	0.50	100 B	100	MG/L	
SW6010B/NONE	WG	D-18GW001	N	Magnesium	0.50	40	40	MG/L	
SW6010B/NONE	WG	D-18GW001	N	Potassium	1.0	4.0	4.0	MG/L	
SW6010B/NONE	WG	D-18GW001	N	Sodium	0.50	89 B	89	MG/L	
SW6010B/NONE	WG	D-18GW002	N	Calcium	0.50	110 B	110	MG/L	
SW6010B/NONE	WG	D-18GW002	N	Magnesium	0.50	39	39	MG/L	
SW6010B/NONE	WG	D-18GW002	N	Potassium	1.0	4.0	4.0	MG/L	
SW6010B/NONE	WG	D-18GW002	N	Sodium	0.50	83 B	83	MG/L	
SW6010B/NONE	WG	D-18GW003	N	Calcium	0.50	120 B	120	MG/L	
SW6010B/NONE	WG	D-18GW003	N	Magnesium	0.50	41	41	MG/L	
SW6010B/NONE	WG	D-18GW003	N	Potassium	1.0	4.1	4.1	MG/L	
SW6010B/NONE	WG	D-18GW003	N	Sodium	0.50	87 B	87	MG/L	
SW6010B/NONE	WG	D-18GW004	N	Calcium	0.50	110 B	110	MG/L	
SW6010B/NONE	WG	D-18GW004	N	Magnesium	0.50	40	40	MG/L	
SW6010B/NONE	WG	D-18GW004	N	Potassium	1.0	4.0	4.0	MG/L	
SW6010B/NONE	WG	D-18GW004	N	Sodium	0.50	87 B	87	MG/L	
SW6010B/NONE	WG	D-18GW005	N	Calcium	0.50	160 B	160	MG/L	
SW6010B/NONE	WG	D-18GW005	N	Magnesium	0.50	46	46	MG/L	
SW6010B/NONE	WG	D-18GW005	N	Potassium	1.0	5.7	5.7	MG/L	
SW6010B/NONE	WG	D-18GW005	N	Sodium	0.50	91 B	91	MG/L	
SW6010B/NONE	WG	D-18GW006	N	Calcium	0.50	160 B	160	MG/L	
SW6010B/NONE	WG	D-18GW006	N	Magnesium	0.50	42	42	MG/L	
SW6010B/NONE	WG	D-18GW006	N	Potassium	1.0	4.4	4.4	MG/L	
SW6010B/NONE	WG	D-18GW006	N	Sodium	0.50	87 B	87	MG/L	

Volatile Organic Compounds by Capillary GC/MS

<u>Test/Leach</u>	<u>Matrix</u>	<u>Field Sample ID</u>	<u>Type</u>	<u>Analyte</u>	<u>RL</u>	<u>Lab Result</u>	<u>Qualified Result</u>	<u>Units</u>	<u>Reason</u>
SW8260B/NONE	WG	C-47FGW001	N	Trichloroethene (TCE)	100	1,600 q	1,600	UG/L	

SDG: G5J130382

Volatile Organic Compounds by Capillary GC/MS

<u>Test/Leach</u>	<u>Matrix</u>	<u>Field Sample ID</u>	<u>Type</u>	<u>Analyte</u>	<u>RL</u>	<u>Lab Result</u>	<u>Qualified Result</u>	<u>Units</u>	<u>Reason</u>
SW8260B/NONE	WG	C-47FGW002	N	Trichloroethene (TCE)	100	1,500 q	1,500	UG/L	
SW8260B/NONE	WG	C-47FGW003	N	Trichloroethene (TCE)	100	1,500 q	1,500	UG/L	
SW8260B/NONE	WG	C-47FGW004	N	Trichloroethene (TCE)	100	1,200 q	1,200	UG/L	

DATA MANAGEMENT NARRATIVE

Laboratory ID: G5J130382

Data Submission

The data submission process incorporates a series of stored procedures designed to identify valid value (VVL), logical (LE), and project specific errors (PSE) in electronic data deliverables (EDD). Automated data review (ADR) is most efficient when data generators correct all errors. Dependent primarily upon the electronic reporting capabilities of the data generator, the severity of the logical and project specific errors listed below have been reduced to warnings. A warning log is generated with each data submission and is presented as an attachment to this report. A brief explanation of each error encountered for this data set and the potential impact on data quality is summarized below.

1. Project Specific Error (PSE) spPSE01L_Missing_CCV

This PSE occurs when an analytical batch is reported without a calibration standard for one or more of the analytes in the batch. In some cases this may be acceptable, such as in the case of multicomponent analytes which are not required to be included in all calibration standards. Chemistry review is necessary to determine whether or not this warning will affect data quality.

2. Logical Error (LE) spLE01_ANADATE_Unique

This logical error occurs when multiple analyses are submitted within the same analytical batch that have identical analysis dates and times. This occurs in the laboratory when instruments are able to perform analyses in less than one minute, as ERPIMS specification records time only to the minute. However, it can also occur if the time of analysis is not recorded by an instrument, and the laboratory analyst reports all measurements in a batch with the same time. Whenever possible, actual times of analysis should be recorded and reported.

3. Project Specific Error (PSE) spPSE01L_Invalid_Test_Prep_Metals

This PSE occurs when the preparation EXMCODE is not either TOTAL or FLDFLT. However, this warning should not have occurred, as it does not pertain to this project.

4. Project Specific Error (PSE) spPSE01L_Invalid_Units_QC

This PSE occurs when laboratory quality control samples are reported with units of percent as opposed to true values. This inconsistency does not affect data quality, unless the submittal is scheduled for delivery to the AFCEE in accordance with the ERPIMS 4.0 specification. Automated data review can be performed for laboratory QC when units are reported in percent or in concentration units. However, to avoid this warning on future submittals, the laboratory would need to report these values in units of concentration (i.e., ug/L).

5. Project Specific Error (PSE) spPSE01L_PQL

This PSE occurs when the Reporting Limit (RL) reported by the laboratory exceeds that specified in the governing project document. This error may affect data quality as it indicates that laboratory cannot report in accordance with project requirements. To avoid this warning on future submittals, the RL must be equal to or below the value specified in the project documentation.

6. Logical Error (LE) spLE01_QAPPFLAGS_F

This LE warning occurs when there are positive results less than the RL and associated QAPPFLAGS are not "F". This requirement is only necessary if the project is an AFCEE project or if the data is to be submitted to ERPIMS. To avoid this warning in the future, apply QAPPFLAGS of "F" whenever the detected result is less than the RL.

7. Valid Value List (VVL) spVVL32_LABLOTCTL

This warning occurs when the laboratory does not include the preparation batch number (LABLOTCTL). The LABLOTCTL field should be populated with the same ID for all field and QC samples extracted/prepared in the same batch. To avoid this warning on future submittals, populate the LABLOTCTL field.

8. Valid Value List (VVL) spVVL33_CALREFID

This valid value warning occurs when the laboratory does not include the calibration reference ID (CALREFID). To avoid this warning in the future, the laboratory should include the CALREFID on the electronic data.

9. Valid Value List (VVL) spVVL56_QAPPFLAGS

This valid value warning occurs when there are QAPPFLAGS in the file that are not official AFCEE qualifiers. Using the official AFCEE qualifiers is necessary only if the project is an AFCEE project or if the data is to be submitted to ERPIMS. To avoid this warning in the future, apply only AFCEE qualifiers to the QAPPFLAGS field.

A detailed description of the stored procedures utilized during the data submission process is provided as an attachment to this report (Submission Warnings).

Submission Warnings

Facility: SWMU 58
Data Generator: SVLS
File Name: N:\Temp Data\Parsons\Tooelle\G5J130382\G5J130382.txt

PSE

<u>Query Name</u>	<u>Finding</u>	<u>Record Count</u>
spPSE01L_Missing_CCV	ANMCODE is E300; LCHMETH is NONE; ANALOT is IC61018; PARLABEL is CL	2
	ANMCODE is E300; LCHMETH is NONE; ANALOT is IC61017; PARLABEL is SO4	2

LE

<u>Query Name</u>	<u>Finding</u>	<u>Record Count</u>
spLE01_ANADATE_Unique	ANMCODE is E300; ANADATE is Oct 17 2005 6:23PM; ANALOT is IC61017	2

PSE

<u>Query Name</u>	<u>Finding</u>	<u>Record Count</u>
spPSE01L_Invalid_Test_Prep_Metals	ANMCODE is SW6010B; EXMCODE is SW3010; PRCCODE is MET; SACODE is MS	4
	ANMCODE is SW6010B; EXMCODE is SW3010; PRCCODE is MET; SACODE is LB	4
	ANMCODE is SW6010B; EXMCODE is SW3010; PRCCODE is MET; SACODE is BS	4
	ANMCODE is SW6010B; EXMCODE is SW3010; PRCCODE is MET; SACODE is N	24
	ANMCODE is SW6010B; EXMCODE is SW3010; PRCCODE is MET; SACODE is FD	4
	ANMCODE is SW6010B; EXMCODE is SW3010; PRCCODE is MET; SACODE is SD	4
spPSE01L_Invalid_Units_QC	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is TB/STD; UNITS is percent	3
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is N/STD; UNITS is percent	12
	ANMCODE is SW6010B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is CV/MET; UNITS is PERCENT	40
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is CV/STD; UNITS is percent	9
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is LB/STD; UNITS is percent	3
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is BD/STD; UNITS is percent	3
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is CV/ORG; UNITS is PERCENT	63

Submission Warnings

Facility: SWMU 58
Data Generator: SVLS
File Name: N:\Temp Data\Parsons\Tooelle\G5J130382\G5J130382.txt

PSE

<u>Query Name</u>	<u>Finding</u>	<u>Record Count</u>
spPSE01L_Invalid_Units_QC	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is BS/STD; UNITS is percent	3
spPSE01L_PQL	SACODE is N; PARLABEL is CL; RL (EDD: Reported / Corrected) is 10.0000 / 1.0000 MG/L; RL (QAPjP) is 0.5000 MG/L; DILUTION is 10.00	6
	SACODE is FD; PARLABEL is NA; RL (EDD: Reported / Corrected) is 0.5000 / 0.5000 MG/L; RL (QAPjP) is 0.2000 MG/L; DILUTION is 1.00	1
	SACODE is N; PARLABEL is NA; RL (EDD: Reported / Corrected) is 0.5000 / 0.5000 MG/L; RL (QAPjP) is 0.2000 MG/L; DILUTION is 1.00	6
	SACODE is FD; PARLABEL is CL; RL (EDD: Reported / Corrected) is 10.0000 / 1.0000 MG/L; RL (QAPjP) is 0.5000 MG/L; DILUTION is 10.00	1
	SACODE is FD; PARLABEL is MG; RL (EDD: Reported / Corrected) is 0.5000 / 0.5000 MG/L; RL (QAPjP) is 0.1000 MG/L; DILUTION is 1.00	1
	SACODE is N; PARLABEL is MG; RL (EDD: Reported / Corrected) is 0.5000 / 0.5000 MG/L; RL (QAPjP) is 0.1000 MG/L; DILUTION is 1.00	6

VVL

<u>Query Name</u>	<u>Finding</u>	<u>Record Count</u>
spLE01_QAPPFLAGS_F	PARVQ is TR; PARVAL is 0.0280; RL is 0.5000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.0430; RL is 0.5000; QAPPFLAGS is J	1
spVVL32_LABLOTCTL	LABLOTCTL is Null	183
spVVL33_CALREFID	CALREFID is Null	234
spVVL56_QAPPFLAGS	QAPPFLAGS is q	18

Total Record Count: 385
Error Count: 0
Warning Count: 644

APPENDIX G

PARSONS

406 West South Jordan Parkway, Suite 300 • South Jordan, Utah 84095 • (801) 572-5999 • Fax (801) 572-9069

Memorandum

To: Dean Reynolds, TEAD; Larry McFarland, TEAD
Copy: Maryellen Mackenzie, USACE; Carl Cole, USACE; Doug Mackenzie, USACE; Richard Jirik, Parsons; Kurt Alloway, Parsons
From: Amanda Evans, Parsons
Date: Wednesday, July 27, 2005
Subject: TEAD SWMU-58 RFI – Waste Management

This letter is to recommend disposition of the waste soil in PARSNZ0518001, PARSNZ0518002, PARSNZ0518003, PARSNZ0518005, PARSNZ0518006, and PARSNZ0518008 in six 55 gallon drums as detailed in Table One, attached. The waste was generated in association with well D-17. Also the disposition of the waste soil in PARSNZ0518701 through PARSNZ0518710 in ten 55 gallon drums as detailed in Table Two, attached. The waste was generated in association with well D-18.

The soils were sampled as IDW54 and IDW55 respectively and tested for TCLP VOCs. Analysis was conducted by Severn Trent Services, Inc, West Sacramento, CA. This laboratory is Utah Certified.

Results have been received as an analytical report and quality control (QC) summary. Parsons has reviewed the data and found the QC to be acceptable. The complete report is attached.

Listed Wastes Analysis:

No constituents were detected.

Therefore it is recommended that waste be treated as non-hazardous with respect to listed codes.

Characteristic Wastes Analysis:

The waste is known to be primarily soil. Therefore generator's reasonable knowledge may be used to exclude the characteristics of ignitability, reactivity and corrosivity.

No constituents were detected. Therefore no characteristic waste codes (40 CFR Part 261.24) should be applied.

Land Disposal Restrictions Analysis:

No constituents were detected (40 CFR Part 268.48), therefore LDRs do not apply.

{

Disposition:

Recommendations for disposal of the soil are to dispose at the drill sites from which the soil originated on the ground around the monitoring well. Parsons will arrange to dispose of the waste per your written instructions.

{

From: "McFarland, Larry" <larry.mcfarland@us.army.mil>
To: "Matt Ivers (Kleinfelder)" <rivers@kleinfelder.com>
Date: 12/1/2005 3:27 PM
Subject: FW: SWMU 58 IDW

-----Original Message-----

From: McFarland, Larry
Sent: Monday, August 01, 2005 9:14 AM
To: Alloway, Kurt; Jirik, Richard (Parsons); Evans, Amanda
Cc: Reynolds, Dean (Environmental)
Subject: SWMU 58 IDW

The Tooele Army Depot (TEAD) Environmental Office has reviewed your memorandum dated July 27, 2005 concerning the recommended disposition of Investigative Derived Waste (IDW) which has been characterized for disposal through sample numbers IDW54 and IDW55. TEAD concurs with Parsons recommended disposition. Based on the analysis provided, the soil cuttings contained in the following containers should be returned to the point of generation (monitoring wells D-17 and D-18), and spread on the surface surrounding the respective monitoring well.

PARSNZ0518001 @ D-17
PARSNZ0518002 @ D-17
PARSNZ0518003 @ D-17
PARSNZ0518005 @ D-17
PARSNZ0518006 @ D-17
PARSNZ0518008 @ D-17

PARSNZ0518701 @ D-18
PARSNZ0518702 @ D-18
PARSNZ0518703 @ D-18
PARSNZ0818704 @ D-18
PARSNZ0818705 @ D-18
PARSNZ0818706 @ D-18
PARSNZ0818707 @ D-18
PARSNZ0818708 @ D-18
PARSNZ0818709 @ D-18
PARSNZ0818710 @ D-18

Thanks

Larry McFarland
Environmental Office, SJMTE-CS-EO
1 Tooele Army Depot, Building 8
Tooele, Utah 84074-5003
Phone (435) 833-3235 Fax (435) 833-2839
larry.mcfarland@us.army.mil
mcfarlal@emh2.tooele.army.mil



STL Sacramento
880 Riverside Parkway
West Sacramento, CA 95605

Tel: 916 373 5600 Fax: 916 372 1059
www.stl-inc.com

July 25, 2005

STL SACRAMENTO PROJECT NUMBER: G5G140257
PO/CONTRACT: 744139-30012

Jan Barbas
Parsons
406 West South Jordan Parkway
Suite 300
South Jordan, UT 84095

Dear Mr. Barbas,

This report contains the analytical results for the samples received under chain of custody by STL Sacramento on July 14, 2005. These samples are associated with your Tooele Industrial Area project.

The test results in this report meet all NELAC requirements for parameters that accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The case narrative is an integral part of this report.

Preliminary results were sent via e-mail on February 25, 2005.

If you have any questions, please feel free to call me at (916) 374-4427.

Sincerely,

A handwritten signature in black ink, appearing to read "Nilo Ligi".

Nilo Ligi
Project Manager

TABLE OF CONTENTS**STL SACRAMENTO PROJECT NUMBER G5G140257**

Case Narrative	1
STL Sacramento Quality Assurance Program	2
Sample Description Information	3
Chain of Custody Documentation	4
SOLID, 8260B, Vol. Org. TCLP NCanton	9-17
Performed at STL North Canton	
Samples: 1, 2	
Sample Data Sheets	
Method Blank Reports	
Laboratory QC Reports	

CASE NARRATIVE

STL SACRAMENTO PROJECT NUMBER G5G140257

General Comments

Sample: 1, 2

Samples were received in good condition at STL Sacramento at 3 degrees C. Sample was shipped to STL North Canton where it was received on 7/15/05 at 2.2 degrees C.

SOLID, SW 1311/8260B, TCLP/Volatile Organics

Sample(s): 1, 2

Samples were analysed by method SW 1311/8260B, a TCLP extraction followed by gas chromatography/mass spectrometry (GCMS) analysis. All QA/QC criteria were met.

There were no anomalies associated with this project.



STL



STL Sacramento Certifications/Accreditations

Certifying State	Certificate #	Certifying State	Certificate #
Alaska	UST-055	Oregon*	CA 200005
Arizona	AZ0616	Pennsylvania	68-1272
Arkansas	04-067-0	South Carolina	87014002
California*	01119CA	Texas	TX-270-2004A
Colorado	NA	Utah*	QUAN1
Connecticut	PEI-0691	Virginia	00178
Florida*	E87570	Washington	C087
Georgia	960	West Virginia	9930C, 334
Hawaii	NA	Wisconsin	998204680
Louisiana*	01944	NFESC	NA
Michigan	9947	USACE	NA
Nevada	CA44	USDA Foreign Plant	37-82605
New Jersey*	CA005	USDA Foreign Soil	S-46613
New York*	11666		

*NELAP accredited. A more detailed parameter list is available upon request. Update 1/27/05

QC Parameter Definitions

QC Batch: The QC batch consists of a set of up to 20 field samples that behave similarly (i.e., same matrix) and are processed using the same procedures, reagents, and standards at the same time.

Method Blank: An analytical control consisting of all reagents, which may include internal standards and surrogates, and is carried through the entire analytical procedure. The method blank is used to define the level of laboratory background contamination.

Laboratory Control Sample and Laboratory Control Sample Duplicate (LCS/LCSD):

An aliquot of blank matrix spiked with known amounts of representative target analytes. The LCS (and LCSD as required) is carried through the entire analytical process and is used to monitor the accuracy of the analytical process independent of potential matrix effects. If an LCSD is performed, it may also be used to evaluate the precision of the process.

Duplicate Sample (DU): Different aliquots of the same sample are analyzed to evaluate the precision of an analysis.

Surrogates: Organic compounds not expected to be detected in field samples, which behave similarly to target analytes. These are added to every sample within a batch at a known concentration to determine the efficiency of the sample preparation and analytical process.

Matrix Spike and Matrix Spike Duplicate (MS/MSD): An MS is an aliquot of a matrix fortified with known quantities of specific compounds and subjected to an entire analytical procedure in order to indicate the appropriateness of the method for a particular matrix. The percent recovery for the respective compound(s) is then calculated. The MSD is a second aliquot of the same matrix as the matrix spike, also spiked, in order to determine the precision of the method.

Isotope Dilution: For isotope dilution methods, isotopically labeled analogs (internal standards) of the native target analytes are spiked into the sample at time of extraction. These internal standards are used for quantitation, and monitor and correct for matrix effects. Since matrix effects on method performance can be judged by the recovery of these analogs, there is little added benefit of performing MS/MSD for these methods. MS/MSD are only performed for client or QAPP requirements.

Control Limits: The reported control limits are either based on laboratory historical data, method requirements, or project data quality objectives. The control limits represent the estimated uncertainty of the test results.

Sample Summary

G5G140257

<u>WO#</u>	<u>Sample #</u>	<u>Client Sample ID</u>	<u>Sampling Date</u>	<u>Received Date</u>
HFG4G	1	IDW54	7/6/2005 04:00 PM	7/14/2005 09:00 AM
HFG5N	2	IDW55	7/11/2005 04:15 PM	7/14/2005 09:00 AM

Notes(s):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity, pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight

06/14/05


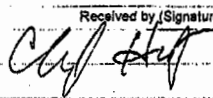
STL Sacramento (916) 373-5800

5 of 17

CHAIN OF CUSTODY		Project Name: Tooele Industrial Area		Contractor: Parsons-SLC		Parsons Point of Contact: Jan Barbas 406 W. South Jordan Parkway Suite 300 South Jordan, Utah 84095 (801) 572-5999 FAX (801) 572-9069						
PARSONS		Project Manager: Ed Staes		Installation: TEAD								
COC ID: 983		Sample Coordinator: Kurt Alloway		Sample Program:								
Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
	IDW55	IDW55	SD	G	N	1	11 Jul 2005	1615	KLA	0	220	2
Analysis	Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot	Remarks: MONITOR well D-18 PARASZOS 18701-10					
TCLPVOC	SVLS											

5 Day Turn-Around REQUESTED

CV

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
 Fred Ex	12 Jul 2005 1630	 Cliff Huf	7-14-05 938

To: STL Laboratories, 880 Riverside Pkwy, W. Sacramento, CA, 95805 (916) 373-5800

Wednesday, July 13, 2005

Page 1 of 1



STL

LOT RECEIPT CHECKLIST STL Sacramento

CLIENT Parsons PM PL LOG # 33497
 LOT# (QUANTIMS ID) 959140257 QUOTE# 62837 LOCATION PL

DATE RECEIVED 7-14-05 TIME RECEIVED 900 Initials CL Date 7-14-05

DELIVERED BY ☒ FEDEX ☐ CA OVERNIGHT ☐ CLIENT
☐ AIRBORNE ☐ GOLDENSTATE ☐ DHL
☐ UPS ☐ BAX GLOBAL ☐ GO-GETTERS
☐ STL COURIER ☐ COURIERS ON DEMAND
☐ OTHER

CUSTODY SEAL STATUS ☒ INTACT ☐ BROKEN ☐ N/A

CUSTODY SEAL #(S) Seal

SHIPPING CONTAINER(S) ☐ STL ☒ CLIENT ☐ N/A

TEMPERATURE RECORD (IN °C) IR 1 ☐ 3 ☒ OTHER ☐

COC #(S) 983, 982

TEMPERATURE BLANK Observed: N/A Corrected: _____

SAMPLE TEMPERATURE

Observed: 2 4 2 Average: 3 Corrected Average: 3

COLLECTOR'S NAME: ☐ Verified from COC ☒ Not on COC

pH MEASURED ☐ YES ☐ ANOMALY ☒ N/A

LABELED BY.....

LABELS CHECKED BY.....

PEER REVIEW ☒ NA

SHORT HOLD TEST NOTIFICATION

SAMPLE RECEIVING

WETCHEM ☒ N/A

VOA-ENCORES ☒ N/A

☐ METALS NOTIFIED OF FILTER/PRESERVE VIA VERBAL & EMAIL ☒ N/A

☒ COMPLETE SHIPMENT RECEIVED IN GOOD CONDITION WITH APPROPRIATE TEMPERATURES, CONTAINERS, PRESERVATIVES ☐ N/A

☐ Clouseau ☐ TEMPERATURE EXCEEDED (2 °C - 6 °C)*1 ☒ N/A

☐ WET ICE ☐ BLUE ICE ☐ GEL PACK ☐ NO COOLING AGENTS USED ☐ PM NOTIFIED

Notes: _____

*1 Acceptable temperature range for State of Wisconsin samples is ≤ 4°C.
 G5G140257 LEAVE NO SPACES BLANK. USE "N/A" IF NOT APPLICABLE AND NOT ALL "N/A" ENTRIES.

Severn Trent Laboratories, Inc
SAMPLE ANALYSIS REQUISITION

LABORATORY: STL N Canton
4101 Shuffel Drive NW
North Canton OH 44720,

NEED ANALYTICAL REPORT BY
7/18/05

ATTN:

LAB PURCHASE ORDER: SR070577

CLIENT CODE: 368391 PROJECT MANAGER: Nilo Ligi

NUMBER OF SAMPLES IN LOT: 0002

MS

Sum
7/15/05

AMS
7/18/05

Summary
Sheets
Printed

SAMPLE I.D.	SAMPLING DATE	ANALYSIS REQUIRED
G5G140257-001 HFG4G-1-AA	7/06/05	Volatile Organics, GC/MS (8260B) (MS8260TP) METHOD: 8260B
G5G140257-002 HFG5N-1-AA	7/11/05	Volatile Organics, GC/MS (8260B) (MS8260TP) METHOD: 8260B

2x250
1

NEED DETECTION LIMIT AND ANALYSIS DATE INCLUDED IN REPORT.

SHIPPING METHOD: FEDEX

DATE: 7/14/05

SEND REPORT TO: NILO LIGI

SAMPLE RECEIVED BY: _____ DATE: _____

PLEASE SEND A SIGNED COPY OF THIS FORM WITH REPORT AT COMPLETION OF ANALYSIS.

THANK YOU.

STL Sacramento

INT: _____

7/14/05 13:48:53

STL N Canton
4101 Shuffel Drive NW
North Canton

OH 44720,

RELINQUISHED BY: [Signature]

DATE/TIME: 7/14/05 16:00

RELINQUISHED BY: _____

DATE/TIME: _____

RECEIVED FOR LAB BY: Matthew C. Kelly

DATE/TIME: 7/15/05 9:40

PLEASE RETURN ORIGINAL SAMPLE ANALYSIS REQUISITION

SOP: NC-SC-0005, Sample Receiving
N:\QAQC\WARRANTY\STL\Cooler Receipt STL\COOLER STL Rev49 062705.doc

SOLID, 8260B, Vol. Org. TCLP NCanton

Parsons Corporation

Client Sample ID: IDW54

TCLP GC/MS Volatiles

Lot-Sample #....: G5G140257-001 Work Order #....: HFG4G1AA Matrix.....: SD
Date Sampled....: 07/06/05 Date Received...: 07/14/05
Leach Date.....: 07/18/05 Prep Date.....: 07/19/05 Analysis Date...: 07/19/05
Leach Batch #...: P519902 Prep Batch #....: 5200677
Dilution Factor: 1
Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING		
		LIMIT	UNITS	MDL
Benzene	ND	0.025	mg/L	0.00023
Carbon tetrachloride	ND	0.025	mg/L	0.00045
Chlorobenzene	ND	0.025	mg/L	0.00028
Chloroform	ND	0.025	mg/L	0.00040
1,2-Dichloroethane	ND	0.025	mg/L	0.00048
1,1-Dichloroethylene	ND	0.070	mg/L	0.00060
Methyl ethyl ketone	ND	0.25	mg/L	0.0010
Tetrachloroethylene	ND	0.070	mg/L	0.00083
Trichloroethylene	ND	0.050	mg/L	0.00041
Vinyl chloride	ND	0.025	mg/L	0.00044

SURROGATE	PERCENT	RECOVERY
	RECOVERY	LIMITS
Dibromofluoromethane	95	(86 - 125)
1,2-Dichloroethane-d4	88	(80 - 122)
Toluene-d8	95	(90 - 122)
4-Bromofluorobenzene	94	(84 - 125)

NOTE(S):

Analysis performed in accordance with USEPA Toxicity Characteristic Leaching Procedure Method 1311

Parsons Corporation

Client Sample ID: IDW55

TCLP GC/MS Volatiles

Lot-Sample #....: G5G140257-002 Work Order #....: HFG5N1AA Matrix.....: SD
Date Sampled....: 07/11/05 Date Received...: 07/14/05
Leach Date.....: 07/18/05 Prep Date.....: 07/19/05 Analysis Date...: 07/19/05
Leach Batch #...: P519902 Prep Batch #....: 5200677
Dilution Factor: 1
Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING		
		LIMIT	UNITS	MDL
Benzene	ND	0.025	mg/L	0.00023
Carbon tetrachloride	ND	0.025	mg/L	0.00045
Chlorobenzene	ND	0.025	mg/L	0.00028
Chloroform	ND	0.025	mg/L	0.00040
1,2-Dichloroethane	ND	0.025	mg/L	0.00048
1,1-Dichloroethylene	ND	0.070	mg/L	0.00060
Methyl ethyl ketone	ND	0.25	mg/L	0.0010
Tetrachloroethylene	ND	0.070	mg/L	0.00083
Trichloroethylene	ND	0.050	mg/L	0.00041
Vinyl chloride	ND	0.025	mg/L	0.00044

SURROGATE	PERCENT	RECOVERY
	RECOVERY	LIMITS
Dibromofluoromethane	96	(86 - 125)
1,2-Dichloroethane-d4	90	(80 - 122)
Toluene-d8	100	(90 - 122)
4-Bromofluorobenzene	103	(84 - 125)

NOTE(S):

Analysis performed in accordance with USEPA Toxicity Characteristic Leaching Procedure Method 1311

QC DATA ASSOCIATION SUMMARY

G5G140257

Sample Preparation and Analysis Control Numbers

<u>SAMPLE#</u>	<u>MATRIX</u>	<u>ANALYTICAL METHOD</u>	<u>LEACH BATCH #</u>	<u>PREP BATCH #</u>	<u>MS RUN#</u>
001	SD	SW846 8260B	P519902	5200677	5200350
002	SD	SW846 8260B	P519902	5200677	5200350

METHOD BLANK REPORT

TCLP GC/MS Volatiles

Client Lot #....: G5G140257
 MB Lot-Sample #: A5G180000-269
 Leach Date.....: 07/18/05
 Leach Batch #...: P519902
 Dilution Factor: 1

Work Order #....: HFPE71AA
 Prep Date.....: 07/19/05
 Prep Batch #....: 5200677

Matrix.....: SOLID
 Analysis Date...: 07/19/05

PARAMETER	RESULT	REPORTING			METHOD
		LIMIT	UNITS		
Benzene	ND	0.025	mg/L		SW846 8260B
Carbon tetrachloride	ND	0.025	mg/L		SW846 8260B
Chlorobenzene	ND	0.025	mg/L		SW846 8260B
Chloroform	ND	0.025	mg/L		SW846 8260B
1,2-Dichloroethane	ND	0.025	mg/L		SW846 8260B
1,1-Dichloroethylene	ND	0.070	mg/L		SW846 8260B
Methyl ethyl ketone	ND	0.25	mg/L		SW846 8260B
Tetrachloroethylene	ND	0.070	mg/L		SW846 8260B
Trichloroethylene	ND	0.050	mg/L		SW846 8260B
Vinyl chloride	ND	0.025	mg/L		SW846 8260B
SURROGATE	PERCENT		RECOVERY		
	RECOVERY		LIMITS		
Dibromofluoromethane	92		(86 - 125)		
1,2-Dichloroethane-d4	88		(80 - 122)		
Toluene-d8	96		(90 - 122)		
4-Bromofluorobenzene	98		(84 - 125)		

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: G5G140257 Work Order #...: HPTX31AA Matrix.....: SOLID
 LCS Lot-Sample#: A5G190000-677
 Prep Date.....: 07/19/05 Analysis Date...: 07/19/05
 Prep Batch #...: 5200677
 Dilution Factor: 1

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>METHOD</u>
Benzene	98	(76 - 118)	SW846 8260B
Chlorobenzene	99	(76 - 113)	SW846 8260B
1,1-Dichloroethylene	97	(67 - 128)	SW846 8260B
Trichloroethylene	98	(76 - 119)	SW846 8260B
Toluene	99	(72 - 117)	SW846 8260B

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Dibromofluoromethane	97	(86 - 124)
1,2-Dichloroethane-d4	90	(80 - 122)
Toluene-d8	99	(90 - 122)
4-Bromofluorobenzene	100	(84 - 125)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #....: G5G140257 Work Order #....: HFTX31AA Matrix.....: SOLID
LCS Lot-Sample#: A5G190000-677
Prep Date.....: 07/19/05 Analysis Date...: 07/19/05
Prep Batch #....: 5200677
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD
Benzene	0.500	0.488	mg/L	98	SW846 8260B
Chlorobenzene	0.500	0.496	mg/L	99	SW846 8260B
1,1-Dichloroethylene	0.500	0.485	mg/L	97	SW846 8260B
Trichloroethylene	0.500	0.488	mg/L	98	SW846 8260B
Toluene	0.500	0.495	mg/L	99	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	97	(86 - 124)
1,2-Dichloroethane-d4	90	(80 - 122)
Toluene-d8	99	(90 - 122)
4-Bromofluorobenzene	100	(84 - 125)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

MATRIX SPIKE SAMPLE EVALUATION REPORT

TCLP GC/MS Volatiles

Client Lot #....: G5G140257 Work Order #....: HFKHW1AQ-MS Matrix.....: SOLID
 MS Lot-Sample #: A5G150189-001 HFKHW1AR-MSD
 Date Sampled....: 07/14/05 Date Received...: 07/15/05
 Leach Date.....: 07/18/05 Prep Date.....: 07/19/05 Analysis Date...: 07/19/05
 Leach Batch #...: P519902 Prep Batch #....: 5200677
 Dilution Factor: 1

PARAMETER	PERCENT	RECOVERY	RPD	RPD	METHOD
	RECOVERY	LIMITS		LIMITS	
Benzene	99	(76 - 117)	2.4	(0-30)	SW846 8260B
	97	(76 - 117)			SW846 8260B
Chlorobenzene	101	(72 - 114)	0.27	(0-30)	SW846 8260B
	101	(72 - 114)			SW846 8260B
1,1-Dichloroethylene	100	(67 - 129)	0.49	(0-30)	SW846 8260B
	100	(67 - 129)			SW846 8260B
Trichloroethylene	103	(72 - 121)	0.12	(0-30)	SW846 8260B
	103	(72 - 121)			SW846 8260B
Toluene	100	(67 - 113)	0.52	(0-30)	SW846 8260B
	99	(67 - 113)			SW846 8260B

SURROGATE	PERCENT	RECOVERY
	RECOVERY	LIMITS
Dibromofluoromethane	96	(86 - 125)
	97	(86 - 125)
1,2-Dichloroethane-d4	95	(80 - 122)
	95	(80 - 122)
Toluene-d8	100	(90 - 122)
	101	(90 - 122)
4-Bromofluorobenzene	104	(84 - 125)
	108	(84 - 125)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

MATRIX SPIKE SAMPLE DATA REPORT

TCLP GC/MS Volatiles

Client Lot #....: G5G140257 Work Order #....: HFKHW1AQ-MS Matrix.....: SOLID
 MS Lot-Sample #: A5G150189-001 HFKHW1AR-MSD
 Date Sampled...: 07/14/05 Date Received...: 07/15/05
 Leach Date.....: 07/18/05 Prep Date.....: 07/19/05 Analysis Date...: 07/19/05
 Leach Batch #...: P519902 Prep Batch #....: 5200677
 Dilution Factor: 1

PARAMETER	SAMPLE	SPIKE	MEASRD	UNITS	PERCNT		METHOD
	AMOUNT	AMT	AMOUNT		RECVRY	RPD	
Benzene	ND	0.500	0.497	mg/L	99		SW846 8260B
	ND	0.500	0.486	mg/L	97	2.4	SW846 8260B
Chlorobenzene	ND	0.500	0.505	mg/L	101		SW846 8260B
	ND	0.500	0.506	mg/L	101	0.27	SW846 8260B
1,1-Dichloroethylene	ND	0.500	0.500	mg/L	100		SW846 8260B
	ND	0.500	0.502	mg/L	100	0.49	SW846 8260B
Trichloroethylene	ND	0.500	0.513	mg/L	103		SW846 8260B
	ND	0.500	0.513	mg/L	103	0.12	SW846 8260B
Toluene	ND	0.500	0.499	mg/L	100		SW846 8260B
	ND	0.500	0.496	mg/L	99	0.52	SW846 8260B

SURROGATE	PERCENT	RECOVERY
	RECOVERY	LIMITS
Dibromofluoromethane	96	(86 - 125)
	97	(86 - 125)
1,2-Dichloroethane-d4	95	(80 - 122)
	95	(80 - 122)
Toluene-d8	100	(90 - 122)
	101	(90 - 122)
4-Bromofluorobenzene	104	(84 - 125)
	108	(84 - 125)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

APPENDIX H

PARSONS

406 West South Jordan Parkway, Suite 300 • South Jordan, Utah 84095 • (801) 572-5999 • Fax (801) 572-9069

Memorandum

To: Dean Reynolds, TEAD; Larry McFarland, TEAD
Copy: Maryellen Mackenzie, USACE; Carl Cole, USACE; Doug Mackenzie, USACE; Richard Jirik, Parsons; Kurt Alloway, Parsons
From: Amanda Evans, Parsons
Date: Thursday, August 4, 2005
Subject: TEAD SWMU-58 RFI – Waste Management

This letter is to recommend disposition of the waste equipment rinsate and drill produced water in Baker Tank PARSNZ0518101 as detailed in Table One, attached.

The equipment rinsate and drill produced water was sampled as IDW57 and tested for VOCs. Analysis was conducted by Severn Trent Services, Inc, West Sacramento, CA. This laboratory is Utah Certified.

Results have been received as an analytical report and quality control (QC). Parsons has reviewed the data and found the QC to be acceptable. The complete report is attached.

Listed Wastes Analysis:

Carbon tetrachloride was detected at 0.35 ug/L and trichloroethylene at 0.41 ug/L. Therefore it is recommended that the waste be treated as hazardous and coded F001 and F002. Also, chloroform was detected at 0.18 ug/L. No additional waste codes are recommended due to chloroform.

Characteristic Wastes Analysis:

The waste is known to be primarily water. Therefore generator's reasonable knowledge may be used to exclude the characteristics of ignitability, reactivity and corrosivity.

No analytes were detected in excess of TCLP limits. Therefore no characteristic waste codes (40 CFR Part 261.24) should be applied.

Land Disposal Restrictions Analysis:

No compounds were detected in excess of LDR limits for wastewater (40 CFR Part 268.48), therefore the waste is suitable for land disposal.

{

Disposition:

It is recommended that the equipment rinsate and drill produced water be disposed in TEAD's groundwater treatment plant. Parsons will arrange to dispose of the waste per your written instructions.

{

[illegible]

From: McFarland, Larry [mailto:larry.mcfarland@us.army.mil]
Sent: Mon 8/8/2005 1:48 PM
To: Evans, Amanda
Cc: Alloway, Kurt; Kubacki, Steve; Jirik, Richard; Reynolds, Dean (Environmental)
Subject: RE: TEAD IDW Report for IDW57

Amanda,

The Tooele Army Depot (TEAD) Environmental Office has reviewed your memorandum dated August 4, 2005 concerning the recommended disposition of Investigative Derived Waste (IDW) which has been characterized for disposal through sample number IDW57. TEAD concurs with Parsons recommended disposition. Based on the analysis provided, contaminants detected in the decon and development water contained in baker tank # PARSNZ0518101 may be disposed of at Tooele Army Depots Ground Water Treatment System. At your earliest convenience, please make arrangements with the treatment plant operations contractor to dispose of the water.

Thanks
Larry McFarland

-----Original Message-----

From: Evans, Amanda [mailto:Amanda.Evans@parsons.com]
Sent: Thursday, August 04, 2005 1:33 PM
To: Kurt.Alloway@parsons.com; colec@emh2.tooele.army.mil;
doug.d.mackenzie@usace.army.mil; Richard.Jirik@parsons.com;
Maryellen.Mackenzie@usace.army.mil; mcfarlal@emh2.tooele.army.mil;
reynoldd@emh2.tooele.army.mil
Subject: TEAD IDW Report for IDW57

Hello,

You will find attached the report for IDW57. Please contact me if you have any questions or comments.

Thank you,

Amanda M. Evans
Chemist
parsons
406 West South Jordan Parkway, Suite 300
South Jordan, UT 84095
(801)553-3366
(801)572-9069 Fax
<<AME_idw57.pdf>>



STL Sacramento
880 Riverside Parkway
West Sacramento, CA 95605

Tel: 916 373 5600 Fax: 916 372 1059
www.stl-inc.com

July 29, 2005

STL SACRAMENTO PROJECT NUMBER: G5G270244
PO/CONTRACT: 744139-30012

Jan Barbas
Parsons
406 West South Jordan Parkway
Suite 300
South Jordan, UT 84095

Dear Mr. Barbas,

This report contains the analytical results for the sample received under chain of custody by STL Sacramento on July 27, 2005. This sample is associated with your Tooele Industrial Area project.

The test results in this report meet all NELAC requirements for parameters that accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The case narrative is an integral part of this report.

Preliminary results were sent via e-mail on July 29, 2005.

If you have any questions, please feel free to call me at (916) 374-4427.

Sincerely,

A handwritten signature in black ink, appearing to read "Nilo Ligi".

Nilo Ligi
Project Manager

HAZARDOUS WASTE MANIFEST

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. UT 321 3820894		Manifest Document No. P 5011		2. Page 1 of 1		Information in the shaded areas is not required by Federal law.		
3. Generator's Name and Mailing Address TOOELE ARMY DEPOT ENVIRONMENTAL OFFICE, SJMTE-CS-EO BUILDING 8, ATTN: DEAN REYNOLDS, TOOELE, UT 84074						A. State Manifest Document Number				
4. Generator's Phone (435) 833-3504						B. State Generator's ID				
5. Transporter 1 Company Name MP ENVIRONMENTAL						C. State Transporter's ID				
6. US EPA ID Number CAT000624247						D. Transporter's Phone 435-843-7882				
7. Transporter 2 Company Name						E. State Transporter's ID				
8. US EPA ID Number						F. Transporter's Phone				
9. Designated Facility Name and Site Address TOOELE ARMY DEPOT ENVIRONMENTAL OFFICE SJMTE-CS-EO UTAH INDUSTRIAL DEPOT, JADE ST. AND B AVE TOOELE, UT 84074						G. State Facility's ID				
10. US EPA ID Number UT 321 3820894						H. Facility's Phone 435-833-3504				
11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)						12. Containers		13. Total Quantity	14. Unit Wt/Vol	15. Waste No.
a. <input type="checkbox"/> HM HAZDOUS WASTE LIQUID, NOS(TCE), 9 NA 3082 . PG III						No.	Type			
b. <input type="checkbox"/>										
c. <input type="checkbox"/>										
d. <input type="checkbox"/>										
J. Additional Descriptions for Materials Listed Above A. TRICHLOROETHYLENE MONITORING WELL D-17 WATER PARSNZ0519901						K. Handling Codes for Wastes Listed Above				
15. Special Handling Instructions and Additional Information EMERGENCY CONTACT- TOOELE ARMY DEPOT FIRE DEPARTMENT 435-833-2015										
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations. If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.										
Printed/Typed Name Larry McFarland						Signature Larry McFarland		Month Day Year 10/6/95		
17. Transporter 1 Acknowledgement of Receipt of Materials						Signature Ned Anderson		Month Day Year 10/7/95		
18. Transporter 2 Acknowledgement of Receipt of Materials						Signature		Month Day Year		
19. Discrepancy Indication Space										
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.										
Printed/Typed Name Marle D Reynolds						Signature Marle D Reynolds		Month Day Year 10/7/95		

TABLE OF CONTENTS

STL SACRAMENTO PROJECT NUMBER G5G270244

Case Narrative	1
STL Sacramento Quality Assurance Program.....	2
Sample Description Information.....	3
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Lot Receipt Checklist.....	5
WATER, 8260B, Volatile Organics.....	6-199
Sample: 1	
Sample Data Sheet	
Method Blank Report	
Laboratory QC Reports	
Full Data Package	

CASE NARRATIVE**STL SACRAMENTO PROJECT NUMBER G5G270244****General Comments****Sample: 1**

Sample was received in good condition at STL Sacramento at 2 degrees C.

Sample was received with a pH of 8. As the sample was analyzed within 7 days (the normal holding time for an unpreserved sample), there is no impact on the data.

SOLID, SW 8260B, Volatile Organics**Sample(s): 1**

Sample was analysed by method SW 8260B, gas chromatography/mass spectrometry (GCMS) analysis. All QA/QC criteria were met except as noted below.

Naphthalene we detected in the Method Blank below the reporting limit but above the MDL. This compound was not detected in the sample.

Sample(s): 1

Insufficient volume was available for MS/MSD. An LCS/DCS was prepared instead.

There were no other anomalies associated with this project.

G5G27



STL



STL Sacramento Certifications/Accreditations

Certifying State	Certificate #	Certifying State	Certificate #
Alaska	UST-055	Oregon*	CA 200005
Arizona	AZ0616	Pennsylvania	68-1272
Arkansas	04-067-0	South Carolina	87014002
California	01119CA	Texas	TX 270-2004A
Colorado	NA	Utah*	QUANI
Connecticut	PH-0691	Virginia	00178
Florida*	E87570	Washington	C087
Georgia	960	West Virginia	99506-3343
Hawaii	NA	Wisconsin	998204680
Louisiana	01944	NHESC	NA
Michigan	9947	USACE	NA
Nevada	C634	USDA Foreign Plant	3782605
New Jersey*	CA005	USDA Foreign Soil	S-46613
New York*	11666		

*NELAP accredited. A more detailed parameter list is available upon request. Update 1/27/05

QC Parameter Definitions

QC Batch: The QC batch consists of a set of up to 20 field samples that behave similarly (i.e., same matrix) and are processed using the same procedures, reagents, and standards at the same time.

Method Blank: An analytical control consisting of all reagents, which may include internal standards and surrogates, and is carried through the entire analytical procedure. The method blank is used to define the level of laboratory background contamination.

Laboratory Control Sample and Laboratory Control Sample Duplicate (LCS/LCSD): An aliquot of blank matrix spiked with known amounts of representative target analytes. The LCS (and LCSD as required) is carried through the entire analytical process and is used to monitor the accuracy of the analytical process independent of potential matrix effects. If an LCSD is performed, it may also be used to evaluate the precision of the process.

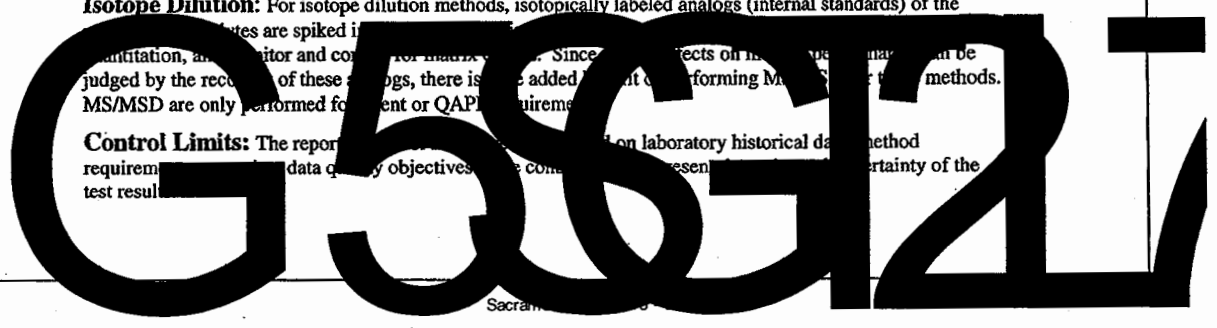
Duplicate Sample (DU): Different aliquots of the same sample are analyzed to evaluate the precision of an analysis.

Surrogates: Organic compounds not expected to be detected in field samples, which behave similarly to target analytes. These are added to every sample within a batch at a known concentration to determine the efficiency of the sample preparation and analytical process.

Matrix Spike and Matrix Spike Duplicate (MS/MSD): An MS is an aliquot of a matrix fortified with known quantities of specific compounds and subjected to an entire analytical procedure in order to indicate the appropriateness of the method for a particular matrix. The percent recovery for the respective compound(s) is then calculated. The MSD is a second aliquot of the same matrix as the matrix spike, also spiked, in order to determine the precision of the method.

Isotope Dilution: For isotope dilution methods, isotopically labeled analogs (internal standards) of the analytes are spiked into the sample. Since these standards are added to the sample, they are not subject to the same losses as the analytes. The recovery of these standards is used to correct for losses during sample preparation. Since the recovery of these standards is known, there is no need to add a second aliquot of the sample for performing MS/MSD. MS/MSD are only performed for method or QAPL requirements.

Control Limits: The reportable data quality objectives are based on laboratory historical data. The method requirements for data quality objectives are based on laboratory historical data. The method requirements for data quality objectives are based on laboratory historical data. The method requirements for data quality objectives are based on laboratory historical data.



Sacramento

Sample Summary G5G270244

<u>WO#</u>	<u>Sample #</u>	<u>Client Sample ID</u>	<u>Sampling Date</u>	<u>Received Date</u>
HGC7Q	1	IDW57	7/25/2005 04:00 PM	7/27/2005 09:00 AM

Notes(s):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity, pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight

G5G27

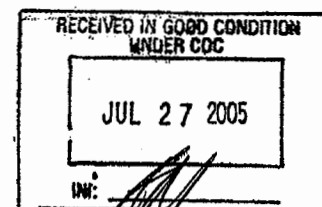
Sacramento

CHAIN OF CUSTODY		Project Name: Tooele Industrial Area		Contractor: Parsons-SLC		Parsons Point of Contact: Jan Barbas 406 W. South Jordan Parkway Suite 300 South Jordan, Utah 84085 (801) 572-5999 FAX (801) 572-9089						
COC ID: _____		Project Manager: Ed Staes		Installation: TEAD								
		Sample Coordinator: Kurt Alloway		Sample Program: _____								
Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
		IDW57	VW	G	N	1	25-JUL-2005	1600	KLA	—	—	3
Analysis		Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot	Remarks:				
		SVLS										

PARSNZOS18101

D-17, 18, 19 D&W/DECON WORKER

5-Day TURN AROUND REQUESTED



Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
<i>[Signature]</i>	26 JUL 05 / 1500	<i>[Signature]</i>	7/27/05 11:30

To: STL Laboratories, 880 Riverside Pkwy, W. Sacramento, CA, 95605 (916) 373-5800

Monday, July 25, 2005

Page 1 of 1

SEVERN
TRENT

STL

LOT RECEIPT CHECKLIST
STL Sacramento

CLIENT PACOWP PM 11 LOG # _____
LOT# (QUANTIMS ID) 656270244 QUOTE# 47837 LOCATION VB
DATE RECEIVED 7/27/05 TIME RECEIVED 9:00 Initials MM Date 7/27/05
DELIVERED BY ☒ FEDEX ☐ CA OVERNIGHT ☐ CLIENT
☐ AIRBORNE ☐ GOLDENSTATE ☐ DHL
☐ UPS ☐ BAX GLOBAL ☐ GO-GETTERS
☐ STL COURIER ☐ COURIERS ON DEMAND
☐ OTHER _____
CUSTODY SEAL STATUS ☒ INTACT ☐ BROKEN ☐ N/A
CUSTODY SEAL #(S) NA
SHIPPING CONTAINER(S) ☐ STL ☒ CLIENT ☐ N/A
TEMPERATURE RECORD (IN °C) IR 1 ☐ 3 ☒ OTHER _____
COC #(S) _____
TEMPERATURE BLANK Observed: NA Corrected: NA
SAMPLE TEMPERATURE
Observed: 22 22 22 Average: 22 Corrected Average: NA
COLLECTOR'S NAME: ☐ Verified from COC ☒ Not on COC
pH MEASURED ☐ YES ☐ ANOMALY ☒ N/A
LABELED BY _____
LABELS CHECKED BY _____
PEER REVIEW ☒ NA
SHORT HOLD TEST NOTIFICATION
SAMPLE RECEIVING
WETCHEM ☒ N/A
VOA-ENCORES ☒ N/A
☐ METALS NOTIFIED OF FILTER/PRESERVE VIA VERBAL & EMAIL ☒ N/A
☒ COMPLETE SHIPMENT RECEIVED IN GOOD CONDITION WITH
ADDITIONAL TEMPERATURES, ☐ N/A
☐ Bureau ☐ TEMPERATURE EXCEEDED (2-6) ☐ N/A
☐ WET ICE ☐ BLUE ICE ☐ NO COOLING AGENTS USED ☐ PM NOTIFIED
ES: _____
*1 Acceptable temperature range for _____ of Wisconsin _____ is _____
LEA _____ USE "N/A" _____

WATER, 8260B, Volatile
Organics

G55GT27

Parsons Corporation

Client Sample ID: IDW57

GC/MS Volatiles

Lot-Sample #....: G5G270244-001 Work Order #....: HGC7Q1AA Matrix.....: WATER
 Date Sampled....: 07/25/05 Date Received...: 07/27/05
 Prep Date.....: 07/27/05 Analysis Date...: 07/27/05
 Prep Batch #....: 5209199
 Dilution Factor: 1 Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING		
		LIMIT	UNITS	MDL
Benzene	ND	1.0	ug/L	0.13
Carbon tetrachloride	0.35 J	1.0	ug/L	0.15
Chloroethane	ND	1.0	ug/L	0.34
Chloroform	0.18 J	1.0	ug/L	0.12
1,1-Dichloroethane	ND	1.0	ug/L	0.10
1,2-Dichloroethane	ND	1.0	ug/L	0.22
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.10
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.11
1,1-Dichloroethene	ND	1.0	ug/L	0.36
1,2-Dichloropropane	ND	1.0	ug/L	0.15
Ethylbenzene	ND	1.0	ug/L	0.27
Methylene chloride	ND	2.0	ug/L	0.35
Naphthalene	ND	1.0	ug/L	0.15
Tetrachloroethene	ND	1.0	ug/L	0.38
Toluene	ND	1.0	ug/L	0.25
1,1,1-Trichloroethane	ND	1.0	ug/L	0.41
1,1,2-Trichloroethane	ND	1.0	ug/L	0.31
Trichloroethene	0.41 J	1.0	ug/L	0.31
Vinyl chloride	ND	1.0	ug/L	0.12
m-Xylene & p-Xylene	ND	1.0	ug/L	0.18
o-Xylene	ND	1.0	ug/L	0.10

SURROGATE	PERCENT	RECOVERY
	RECOVERY	LIMITS
4-Bromofluorobenzene	99	(70 - 130)
1,2-Dichloroethane-d4	107	(70 - 130)
Toluene-d8	110	(70 - 130)
Dibromofluoromethane	110	(70 - 130)

NOTE(S):

J Estimated result. Result is less than RL.

G5G27

QC DATA ASSOCIATION SUMMARY

G5G270244

Sample Preparation and Analysis Control Numbers

<u>SAMPLE#</u>	<u>MATRIX</u>	<u>ANALYTICAL METHOD</u>	<u>LEACH BATCH #</u>	<u>PREP BATCH #</u>	<u>MS RUN#</u>
001	WATER	SW846 8260B		5209199	

G5G27

Sacramento

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #....: G5G270244
MB Lot-Sample #: G5G280000-199

Work Order #....: HGFJW1AA

Matrix.....: WATER

Prep Date.....: 07/27/05

Analysis Date...: 07/27/05

Prep Batch #....: 5209199

Dilution Factor: 1

PARAMETER	RESULT	REPORTING			METHOD
		LIMIT	UNITS		
Benzene	ND	1.0	ug/L		SW846 8260B
Carbon tetrachloride	ND	1.0	ug/L		SW846 8260B
Chloroethane	ND	1.0	ug/L		SW846 8260B
Chloroform	ND	1.0	ug/L		SW846 8260B
1,1-Dichloroethane	ND	1.0	ug/L		SW846 8260B
1,2-Dichloroethane	ND	1.0	ug/L		SW846 8260B
1,1-Dichloroethene	ND	1.0	ug/L		SW846 8260B
cis-1,2-Dichloroethene	ND	1.0	ug/L		SW846 8260B
trans-1,2-Dichloroethene	ND	1.0	ug/L		SW846 8260B
1,2-Dichloropropane	ND	1.0	ug/L		SW846 8260B
Ethylbenzene	ND	1.0	ug/L		SW846 8260B
Methylene chloride	ND	2.0	ug/L		SW846 8260B
Naphthalene	0.18 J	1.0	ug/L		SW846 8260B
Tetrachloroethene	ND	1.0	ug/L		SW846 8260B
Toluene	ND	1.0	ug/L		SW846 8260B
1,1,1-Trichloroethane	ND	1.0	ug/L		SW846 8260B
1,1,2-Trichloroethane	ND	1.0	ug/L		SW846 8260B
Trichloroethene	ND	1.0	ug/L		SW846 8260B
Vinyl chloride	ND	1.0	ug/L		SW846 8260B
o-Xylene	ND	1.0	ug/L		SW846 8260B
m-Xylene & p-Xylene	ND	1.0	ug/L		SW846 8260B

SURROGATE	PERCENT		RECOVERY LIMITS
	RECOVERY		
4-Bromofluorobenzene	99		(70 - 130)
1,2-Dichloroethane-d4	99		(70 - 130)
Toluene-d8	106		(70 - 130)
Dibromofluoromethane	103		(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

J Estimated result. Result is less than RL.

G5G270244

Sacramento

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #....: G5G270244 Work Order #....: HGFJW1AC-LCS Matrix.....: WATER
 LCS Lot-Sample#: G5G280000-199 HGFJW1AD-LCSD
 Prep Date.....: 07/27/05 Analysis Date...: 07/27/05
 Prep Batch #....: 5209199
 Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	RPD	METHOD
Chlorobenzene	20.0	18.6	ug/L	93		SW846 8260B
	20.0	20.3	ug/L	102	9.0	SW846 8260B
Benzene	20.0	19.7	ug/L	99		SW846 8260B
	20.0	20.9	ug/L	104	5.8	SW846 8260B
1,1-Dichloroethene	20.0	19.6	ug/L	98		SW846 8260B
	20.0	22.2	ug/L	111	13	SW846 8260B
Toluene	20.0	19.5	ug/L	97		SW846 8260B
	20.0	21.2	ug/L	106	8.6	SW846 8260B
Trichloroethene	20.0	18.6	ug/L	93		SW846 8260B
	20.0	20.2	ug/L	101	8.3	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	86	(70 - 130)
	97	(70 - 130)
1,2-Dichloroethane-d4	89	(70 - 130)
	97	(70 - 130)
Toluene-d8	95	(70 - 130)
	105	(70 - 130)
Dibromofluoromethane	93	(70 - 130)
	100	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

G5G27

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: G5G270244 Work Order #...: HGFJWL1AC-LCS Matrix.....: WATER
 LCS Lot-Sample#: G5G280000-199 HGFJWL1AD-LCSD
 Prep Date.....: 07/27/05 Analysis Date...: 07/27/05
 Prep Batch #...: 5209199
 Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Chlorobenzene	93	(80 - 120)			SW846 8260B
	102	(80 - 120)	9.0	(0-30)	SW846 8260B
Benzene	99	(80 - 120)			SW846 8260B
	104	(80 - 120)	5.8	(0-30)	SW846 8260B
1,1-Dichloroethene	98	(80 - 120)			SW846 8260B
	111	(80 - 120)	13	(0-30)	SW846 8260B
Toluene	97	(80 - 120)			SW846 8260B
	106	(80 - 120)	8.6	(0-30)	SW846 8260B
Trichloroethene	93	(80 - 120)			SW846 8260B
	101	(80 - 120)	8.3	(0-30)	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	86	(70 - 130)
	97	(70 - 130)
1,2-Dichloroethane-d4	89	(70 - 130)
	97	(70 - 130)
Toluene-d8	95	(70 - 130)
	105	(70 - 130)
Dibromofluoromethane	93	(70 - 130)
	100	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

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